
Metashape Python Reference

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CONTENTS

1 Overview	3
2 Application Modules	5
3 Python API Change Log	317
Python Module Index	359

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OVERVIEW

1.1 Introduction to Python scripting in Metashape Professional

This API is in development and will be extended in the future Metashape releases.

Note: Python scripting is supported only in Metashape Professional edition.

Metashape Professional uses Python 3.8 as a scripting engine.

Python commands and scripts can be executed in Metashape in one of the following ways:

- From Metashape “Console” pane using it as standard Python console.
- From the “Tools” menu using “Run script...” command.
- From command line using “-r” argument and passing the path to the script as an argument.

The following Metashape functionality can be accessed from Python scripts:

- Open/save/create Metashape projects.
- Add/remove chunks, cameras, markers.
- Add/modify camera calibrations, ground control data, assign geographic projections and coordinates.
- Perform processing steps (align photos, build dense cloud, build mesh, texture, decimate model, etc...).
- Export processing results (models, textures, orthophotos, DEMs).
- Access data of generated models, point clouds, images.
- Start and control network processing tasks.

APPLICATION MODULES

Metashape module provides access to the core processing functionality, including support for inspection and manipulation with project data.

The main component of the module is a Document class, which represents a Metashape project. Multiple Document instances can be created simultaneously if needed. Besides that a currently opened project in the application can be accessed using `Metashape.app.document` property.

The following example performs main processing steps on existing project and saves back the results:

```
>>> import Metashape
>>> doc = Metashape.app.document
>>> doc.open("project.psz")
>>> chunk = doc.chunk
>>> chunk.matchPhotos(downscale=1, generic_preselection=True, reference_
↳preselection=False)
>>> chunk.alignCameras()
>>> chunk.buildDepthMaps(downscale=4, filter_mode=Metashape.AggressiveFiltering)
>>> chunk.buildModel(source_data=Metashape.DepthMapsData, surface_type=Metashape.
↳Arbitrary, interpolation=Metashape.EnabledInterpolation)
>>> chunk.buildUV(mapping_mode=Metashape.GenericMapping)
>>> chunk.buildTexture(blending_mode=Metashape.MosaicBlending, texture_size=4096)
>>> doc.save()
```

class Metashape.Antenna

GPS antenna position relative to camera.

bias

GNSS bias.

Type

Metashape.Vector

bias_acc

GNSS bias accuracy.

Type

Metashape.Vector

bias_covariance

GNSS bias covariance.

Type

Metashape.Matrix

bias_fixed

Fix GNSS bias flag.

Type
bool

bias_ref

GNSS bias reference.

Type
Metashape.Vector

copy()

Return a copy of the object.

Returns
A copy of the object.

Return type
Metashape.Antenna

fixed

Fix antenna location and rotation flags.

Type
bool

location

Antenna coordinates.

Type
Metashape.Vector

location_acc

Antenna location accuracy.

Type
Metashape.Vector

location_covariance

Antenna location covariance.

Type
Metashape.Matrix

location_fixed

Fix antenna location flag.

Type
bool

location_ref

Antenna location reference.

Type
Metashape.Vector

rotation

Antenna rotation angles.

Type
Metashape.Vector

rotation_acc

Antenna rotation accuracy.

Type

Metashape.Vector

rotation_covariance

Antenna rotation covariance.

Type

Metashape.Matrix

rotation_fixed

Fix antenna rotation flag.

Type

bool

rotation_ref

Antenna rotation reference.

Type

Metashape.Vector

class Metashape.Application

Application class provides access to several global application attributes, such as document currently loaded in the user interface, software version and GPU device configuration. It also contains helper routines to prompt the user to input various types of parameters, like displaying a file selection dialog or coordinate system selection dialog among others.

An instance of Application object can be accessed using `Metashape.app` attribute, so there is usually no need to create additional instances in the user code.

The following example prompts the user to select a new coordinate system, applies it to the active chunk and saves the project under the user selected file name:

```
>>> import Metashape
>>> doc = Metashape.app.document
>>> crs = Metashape.app.getCoordinateSystem("Select Coordinate System", doc.chunk.
↳ crs)
>>> doc.chunk.crs = crs
>>> path = Metashape.app.getSaveFileName("Save Project As")
>>> try:
...     doc.save(path)
... except RuntimeError:
...     Metashape.app.messageBox("Can't save project")
```

class ConsolePane

ConsolePane class provides access to the console pane

clear()

Clear console pane.

contents

Console pane contents.

Type

str

class ModelView

ModelView class provides access to the model view

class ModelViewMode

Model view mode in [ModelViewTextured, ModelViewShaded, ModelViewSolid, ModelViewWireframe, ModelViewElevation, ModelViewConfidence]

class PointCloudViewMode

Point cloud view mode in [PointCloudViewSolid, PointCloudViewColor, PointCloudViewClassification, PointCloudViewIntensity, PointCloudViewElevation, PointCloudViewConfidence, PointCloudViewReturnNumber, PointCloudViewScanAngle, PointCloudViewSourceId, PointCloudViewDifference]

class TiePointsViewMode

Tie points view mode in [TiePointsViewColor, TiePointsViewElevation, TiePointsViewImageCount, TiePointsViewVariance]

class TiledModelViewMode

Tiled model view mode in [TiledModelViewTextured, TiledModelViewSolid, TiledModelViewWireframe, TiledModelViewElevation]

captureVideo(*path*, *width*, *height* [, *frame_rate*] [, *transparent*] [, *compressed*] [, *hide_items*])

Capture video using camera track. Transparent capture can't be compressed. Method requires gui and inaccessible from python module. If script is passed as a program argument, `-gui` flag should be specified.

Parameters

- **path** (*str:arg width: Video width.*) – Output path.
- **height** (*int*) – Video height.
- **frame_rate** (*int*) – Video frame rate.
- **transparent** (*bool*) – Sets transparent background.
- **compressed** (*bool*) – Enables video compression.
- **hide_items** (*bool*) – Hides all items.

captureView([*width*] [, *height*] [, *transparent*] [, *hide_items*])

Capture image from model view.

Parameters

- **width** (*int*) – Image width.
- **height** (*int*) – Image height.
- **transparent** (*bool*) – Sets transparent background.
- **hide_items** (*bool*) – Hides all items.

Returns

Captured image.

Return type

Metashape.Image

model_view_mode

Model view mode.

Type

Metashape.Application.ModelView.ModelViewMode

point_cloud_view_mode

Point cloud view mode.

Type

Metashape.Application.ModelView.PointCloudViewMode

show_basemap

Show or hide basemap.

Type

bool

show_cameras

Show or hide cameras.

Type

bool

show_elevation

Display digital elevation model.

Type

bool

show_laser_scans

Show or hide laser scans.

Type

bool

show_markers

Show or hide markers.

Type

bool

show_orthomosaic

Display orthomosaic.

Type

bool

show_shapes

Show or hide shapes.

Type

bool

show_trajectory

Show or hide trajectory.

Type

bool

texture_view_mode

Texture view mode.

Type

Metashape.Model.TextureType

tie_points_view_mode

Tie points view mode.

Type

Metashape.Application.ModelView.TiePointsViewMode

tiled_model_view_mode

Tiled model view mode.

Type

Metashape.Application.ModelView.TiledModelViewMode

view_mode

View mode.

Type

Metashape.DataSource

viewpoint

Viewpoint in the model view.

Type

Metashape.Viewpoint

class OrthoView

OrthoView class provides access to the ortho view

captureView(*[width]*, *[, height]*, *[, transparent]*, *[, hide_items]*)

Capture image from ortho view.

Parameters

- **width** (*int*) – Image width.
- **height** (*int*) – Image height.
- **transparent** (*bool*) – Sets transparent background.
- **hide_items** (*bool*) – Hides all items.

Returns

Captured image.

Return type

Metashape.Image

center

Ortho view center coordinates.

Type

Metashape.Vector

height

Ortho view window height.

Type

int

projection

Ortho view projection.

Type

Metashape.OrthoProjection

scale

Ortho view scale in px/m.

Type

float

view_mode

View mode.

Type

Metashape.DataSource

width

Ortho view window width.

Type

int

class PhotoView

PhotoView class provides access to the photo view

camera

Get currently opened camera.

Type

Metashape.Camera

captureView(*[width]* [*, height*] [*, transparent*] [*, hide_items*])

Capture image from photo view.

Parameters

- **width** (*int*) – Image width.
- **height** (*int*) – Image height.
- **transparent** (*bool*) – Sets transparent background.
- **hide_items** (*bool*) – Hides all items.

Returns

Captured image.

Return type

Metashape.Image

center

Image coordinates at photo view center.

Type

Metashape.Vector

close()

Close active photo view.

height

Photo view window height.

Type

int

open(*camera*, *new_tab=False*)

Open camera in photo view.

Parameters

- **camera** (*Metashape.Camera*) – Camera to open.
- **new_tab** (*bool*) – Open camera in new tab.

scale

Photo view scale in view px / image px

Type

float

show_markers

Show or hide markers.

Type

bool

show_shapes

Show or hide shapes.

Type

bool

width

Photo view window width.

Type
int

class PhotosPane

PhotosPane class provides access to the photos pane

resetFilter()

Reset photos pane filter.

setFilter(*items*)

Set photos pane filter.

Parameters

items (*list*[*Metashape.Camera* / *Metashape.Marker*]) – filter to apply.

class Settings

PySettings()

Application settings

language

User interface language.

Type
str

load()

Load settings from disk.

log_enable

Enable writing log to file.

Type
bool

log_path

Log file path.

Type
str

network_enable

Network processing enabled flag.

Type
bool

network_host

Network server host name.

Type
str

network_path

Network data root path.

Type
str

network_port

Network server control port.

Type
int

project_absolute_paths

Store absolute image paths in project files.

Type

bool

project_compression

Project compression level.

Type

int

save()

Save settings on disk.

setValue(key, value)

Set settings value.

Parameters

- **key** (*str*) – Key.
- **value** (*object*) – Value.

value(key)

Return settings value.

Parameters

key (*str*) – Key.

Returns

Settings value.

Return type

object

activated

Metashape activation status.

Type

bool

addMenuItem(label, func[, shortcut][, icon])

Create a new menu entry.

Parameters

- **label** (*str*) – Menu item label.
- **func** (*function*) – Function to be called.
- **shortcut** (*str*) – Keyboard shortcut.
- **icon** (*str*) – Icon.

addMenuSeparator(label)

Add menu separator.

Parameters

label (*str*) – Menu label.

console_pane

Console pane.

Type

Metashape.Application.ConsolePane

cpu_enable

Use CPU when GPU is active.

Type

bool

document

Main application document object.

Type

Metashape.Document

enumGPUDevices()

Enumerate installed GPU devices.

Returns

A list of devices.

Return type

list

getBool(label="")

Prompt user for the boolean value.

Parameters

label (*str*) – Optional text label for the dialog.

Returns

Boolean value selected by the user.

Return type

bool

getCoordinateSystem([label][, value])

Prompt user for coordinate system.

Parameters

- **label** (*str*) – Optional text label for the dialog.
- **value** (*Metashape.CoordinateSystem*) – Default value.

Returns

Selected coordinate system. If the dialog was cancelled, None is returned.

Return type

Metashape.CoordinateSystem

getExistingDirectory([hint][, dir])

Prompt user for the existing folder.

Parameters

- **hint** (*str*) – Optional text label for the dialog.
- **dir** (*str*) – Optional default folder.

Returns

Path to the folder selected. If the input was cancelled, empty string is returned.

Return type

str

getFloat(*label=""*, *value=0*)

Prompt user for the floating point value.

Parameters

- **label** (*str*) – Optional text label for the dialog.
- **value** (*float*) – Default value.

Returns

Floating point value entered by the user.

Return type

float

getInt(*label=""*, *value=0*)

Prompt user for the integer value.

Parameters

- **label** (*str*) – Optional text label for the dialog.
- **value** (*int*) – Default value.

Returns

Integer value entered by the user.

Return type

int

getOpenFileName(*[hint]*, *[dir]*, *[filter]*)

Prompt user for the existing file.

Parameters

- **hint** (*str*) – Optional text label for the dialog.
- **dir** (*str*) – Optional default folder.
- **filter** (*str*) – Optional file filter, e.g. “Text file (*.txt*)” or “.txt”. Multiple filters are separated with “;”.

Returns

Path to the file selected. If the input was cancelled, empty string is returned.

Return type

str

getOpenFileNames(*[hint]*, *[dir]*, *[filter]*)

Prompt user for one or more existing files.

Parameters

- **hint** (*str*) – Optional text label for the dialog.
- **dir** (*str*) – Optional default folder.
- **filter** (*str*) – Optional file filter, e.g. “Text file (*.txt*)” or “.txt”. Multiple filters are separated with “;”.

Returns

List of file paths selected by the user. If the input was cancelled, empty list is returned.

Return type

list

getSaveFileName(*[hint]*, *[dir]*, *[filter]*)

Prompt user for the file. The file does not have to exist.

Parameters

- **hint** (*str*) – Optional text label for the dialog.
- **dir** (*str*) – Optional default folder.
- **filter** (*str*) – Optional file filter, e.g. “Text file (.txt)” or “.txt”. Multiple filters are separated with “;”.

Returns

Path to the file selected. If the input was cancelled, empty string is returned.

Return type

str

getString(*label=""*, *value=""*)

Prompt user for the string value.

Parameters

- **label** (*str*) – Optional text label for the dialog.
- **value** (*str*) – Default value.

Returns

String entered by the user.

Return type

str

gpu_mask

GPU device bit mask: 1 - use device, 0 - do not use (i.e. value 5 enables device number 0 and 2).

Type

int

messageBox(*message*)

Display message box to the user.

Parameters

message (*str*) – Text message to be displayed.

model_view

Model view.

Type

Metashape.Application.ModelView

ortho_view

Ortho view.

Type

Metashape.Application.OrthoView

photo_view

Photo view.

Type

Metashape.Application.PhotoView

photos_pane

Photos pane.

Type

Metashape.Application.PhotosPane

quit()

Exit application.

releaseFreeMemory()

Call malloc_trim on Linux (does nothing on other OS).

removeMenuItem(*label*)

Remove menu entry with given label (if exists). If there are multiple entries with given label - all of them will be removed.

Parameters

label (*str*) – Menu item label.

settings

Application settings.

Type

Metashape.Application.Settings

title

Application name.

Type

str

update()

Update user interface during long operations.

version

Metashape version.

Type

str

class Metashape.AttachedGeometry

Attached geometry data.

GeometryCollection(*geometries*)

Create a GeometryCollection geometry.

Parameters

geometries (*list[Metashape.AttachedGeometry]*) – Child geometries.

Returns

A GeometryCollection geometry.

Return type

Metashape.AttachedGeometry

LineString(*coordinates*)

Create a LineString geometry.

Parameters

coordinates (*list[int]*) – List of vertex coordinates.

Returns

A LineString geometry.

Return type

Metashape.AttachedGeometry

MultiLineString(*geometries*)

Create a MultiLineString geometry.

Parameters

geometries (*list*[*Metashape.AttachedGeometry*]) – Child line strings.

Returns

A point geometry.

Return type

Metashape.AttachedGeometry

MultiPoint(*geometries*)

Create a MultiPoint geometry.

Parameters

geometries (*list*[*Metashape.AttachedGeometry*]) – Child points.

Returns

A point geometry.

Return type

Metashape.AttachedGeometry

MultiPolygon(*geometries*)

Create a MultiPolygon geometry.

Parameters

geometries (*list*[*Metashape.AttachedGeometry*]) – Child polygons.

Returns

A point geometry.

Return type

Metashape.AttachedGeometry

Point(*key*)

Create a Point geometry.

Parameters

key (*int*) – Point marker key.

Returns

A point geometry.

Return type

Metashape.AttachedGeometry

Polygon(*exterior_ring*[, *interior_rings*])

Create a Polygon geometry.

Parameters

- **exterior_ring** (*list*[*int*]) – Point coordinates.
- **interior_rings** (*list*[*int*]) – Point coordinates.

Returns

A Polygon geometry.

Return type

Metashape.AttachedGeometry

coordinates

List of vertex keys.

Type

list[int]

geometries

List of child geometries.

Type

list[*Metashape.AttachedGeometry*]

type

Geometry type.

Type

Metashape.Geometry.Type

class Metashape.BBox

Axis aligned bounding box

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.BBox

max

Maximum bounding box extent.

Type

Metashape.Vector

min

Minimum bounding box extent.

Type

Metashape.Vector

size

Bounding box dimension.

Type

int

class Metashape.BlendingMode

Blending mode in [AverageBlending, MosaicBlending, MinBlending, MaxBlending, DisabledBlending]

class Metashape.Calibration

Calibration object contains camera calibration information including image size, focal length, principal point coordinates and distortion coefficients.

b1

Affinity.

Type
float

b2

Non-orthogonality.

Type
float

copy()

Return a copy of the object.

Returns
A copy of the object.

Return type
Metashape.Calibration

covariance_matrix

Covariance matrix.

Type
Metashape.Matrix

covariance_params

Covariance matrix parameters.

Type
list[str]

cx

Principal point X coordinate.

Type
float

cy

Principal point Y coordinate.

Type
float

error(point, proj)

Return projection error.

Parameters

- **point** (*Metashape.Vector*) – Coordinates of the point to be projected.
- **proj** (*Metashape.Vector*) – Pixel coordinates of the point.

Returns
2D projection error.

Return type
Metashape.Vector

f

Focal length.

Type
float**height**

Image height.

Type
int**k1**

Radial distortion coefficient K1.

Type
float**k2**

Radial distortion coefficient K2.

Type
float**k3**

Radial distortion coefficient K3.

Type
float**k4**

Radial distortion coefficient K4.

Type
float**load**(*path*, *format=CalibrationFormatXML*)

Loads calibration from file.

Parameters

- **path** (*str*) – path to calibration file
- **format** (*Metashape.CalibrationFormat*) – Calibration format.

p1

Decentering distortion coefficient P1.

Type
float**p2**

Decentering distortion coefficient P2.

Type
float**p3**

Decentering distortion coefficient P3.

Type
float

p4

Decentering distortion coefficient P4.

Type

float

project(*point*)

Return projected pixel coordinates of the point.

Parameters

point (*Metashape.Vector*) – Coordinates of the point to be projected.

Returns

2D projected point coordinates.

Return type

Metashape.Vector

rpc

RPC model.

Type

Metashape.RPCModel

save(*path*, *format=CalibrationFormatXML* [, *label*] [, *pixel_size*] [, *focal_length*], *cx = 0*, *cy = 0*)

Saves calibration to file.

Parameters

- **path** (*str*) – path to calibration file
- **format** (*Metashape.CalibrationFormat*) – Calibration format.
- **label** (*str*) – Calibration label used in Australis, CalibCam and CalCam formats.
- **pixel_size** (*Metashape.Vector*) – Pixel size in mm used to convert normalized calibration coefficients to Australis and CalibCam coefficients.
- **focal_length** (*float*) – Focal length (Grid calibration format only).
- **cx** (*float*) – X principal point coordinate (Grid calibration format only).
- **cy** (*float*) – Y principal point coordinate (Grid calibration format only).

type

Camera model.

Type

Metashape.Sensor.Type

unproject(*point*)

Return direction corresponding to the image point.

Parameters

point (*Metashape.Vector*) – Pixel coordinates of the point.

Returns

3D vector in the camera coordinate system.

Return type

Metashape.Vector

width

Image width.

Type

int

class Metashape.CalibrationFormat

Calibration format in [CalibrationFormatXML, CalibrationFormatAustralis, CalibrationFormatAustralisV7, CalibrationFormatPhotoModeler, CalibrationFormatCalibCam, CalibrationFormatCalCam, CalibrationFormatInpho, CalibrationFormatUSGS, CalibrationFormatPix4D, CalibrationFormatOpenCV, CalibrationFormatPhotomod, CalibrationFormatGrid, CalibrationFormatSTMap]

class Metashape.Camera

Camera instance

```
>>> import Metashape
>>> chunk = Metashape.app.document.addChunk()
>>> chunk.addPhotos(["IMG_0001.jpg", "IMG_0002.jpg"])
>>> camera = chunk.cameras[0]
>>> camera.photo.meta["Exif/FocalLength"]
'18'
```

The following example describes how to create multispectral camera layout:

```
>>> import Metashape
>>> doc = Metashape.app.document
>>> chunk = doc.chunk
>>> rgb = ["RGB_0001.JPG", "RGB_0002.JPG", "RGB_0003.JPG"]
>>> nir = ["NIR_0001.JPG", "NIR_0002.JPG", "NIR_0003.JPG"]
>>> images = [rgb[0], nir[0], rgb[1], nir[1], rgb[2], nir[2]]
>>> groups = [2, 2, 2]
>>> chunk.addPhotos(filenamees=images, filegroups=groups, layout=Metashape.
↳MultiplaneLayout)
```

class Reference

Camera reference data.

accuracy

Camera location accuracy.

Type*Metashape.Vector***enabled**

Location enabled flag.

Type

bool

location

Camera coordinates.

Type*Metashape.Vector***location_accuracy**

Camera location accuracy.

Type*Metashape.Vector*

location_enabled

Location enabled flag.

Type

bool

rotation

Camera rotation angles.

Type

Metashape.Vector

rotation_accuracy

Camera rotation accuracy.

Type

Metashape.Vector

rotation_enabled

Rotation enabled flag.

Type

bool

class Type

Camera type in [Regular, Keyframe]

calibration

Adjusted camera calibration including photo-invariant parameters.

Type

Metashape.Calibration

center

Camera station coordinates for the photo in the chunk coordinate system.

Type

Metashape.Vector

chunk

Chunk the camera belongs to.

Type

Metashape.Chunk

component

Camera component.

Type

Metashape.Component

enabled

Enables/disables the photo.

Type

bool

error(*point*, *proj*)

Returns projection error.

Parameters

- **point** (*Metashape.Vector*) – Coordinates of the point to be projected.

- **proj** (*Metashape.Vector*) – Pixel coordinates of the point.

Returns

2D projection error.

Return type

Metashape.Vector

frames

Camera frames.

Type

list[*Metashape.Camera*]

group

Camera group.

Type

Metashape.CameraGroup

image()

Returns image data.

Returns

Image data.

Return type

Metashape.Image

key

Camera identifier.

Type

int

label

Camera label.

Type

str

layer_index

Camera layer index.

Type

int

location_covariance

Camera location covariance.

Type

Metashape.Matrix

mask

Camera mask.

Type

Metashape.Mask

master

Master camera.

Type

Metashape.Camera

meta

Camera meta data.

Type

Metashape.MetaData

open(*path*[, *layer*])

Loads specified image file.

Parameters

- **path** (*str*) – Path to the image file to be loaded.
- **layer** (*int*) – Optional layer index in case of multipage files.

orientation

Image orientation (1 - normal, 6 - 90 degree, 3 - 180 degree, 8 - 270 degree).

Type

int

photo

Camera photo.

Type

Metashape.Photo

planes

Camera planes.

Type

list[*Metashape.Camera*]

point_cloud

Laser scan for attached cameras.

Type

Metashape.PointCloud

project(*point*)

Returns coordinates of the point projection on the photo.

Parameters

point (*Metashape.Vector*) – Coordinates of the point to be projected.

Returns

2D point coordinates.

Return type

Metashape.Vector

reference

Camera reference data.

Type

Metashape.Camera.Reference

rotation_covariance

Camera rotation covariance.

Type

Metashape.Matrix

selected

Selects/deselects the photo.

Type

bool

sensor

Camera sensor.

Type

Metashape.Sensor

shutter

Camera shutter.

Type

Metashape.Shutter

thumbnail

Camera thumbnail.

Type

Metashape.Thumbnail

transform

4x4 matrix describing photo location in the chunk coordinate system.

Type

Metashape.Matrix

type

Camera type.

Type

Metashape.Camera.Type

unproject(*point*)

Returns coordinates of the point which will have specified projected coordinates.

Parameters

point (*Metashape.Vector*) – Projection coordinates.

Returns

3D point coordinates.

Return type

Metashape.Vector

vignetting

Vignetting for each band.

Type

list[*Metashape.Vignetting*]

class Metashape.CameraGroup

CameraGroup objects define groups of multiple cameras. The grouping is established by assignment of a CameraGroup instance to the Camera.group attribute of participating cameras.

The type attribute of CameraGroup instances defines the effect of such grouping on processing results and can be set to Folder (no effect) or Station (coincident projection centers).

class Type

Camera group type in [Folder, Station]

key

Camera group identifier.

Type
int

label

Camera group label.

Type
str

selected

Current selection state.

Type
bool

type

Camera group type.

Type
Metashape.CameraGroup.Type

class Metashape.CameraTrack

Camera track.

chunk

Chunk the camera track belongs to.

Type
Metashape.Chunk

duration

Animation duration.

Type
float

field_of_view

Vertical field of view in degrees.

Type
float

interpolate(time)

Get animation camera transform matrix.

Parameters
time (*float*) – Animation time point.

Returns

Interpolated camera transformation matrix in chunk coordinate system.

Return type

Metashape.Matrix

key

Camera track identifier.

Type

int

keyframes

Camera track keyframes.

Type

list[*Metashape.Camera*]

label

Animation label.

Type

str

load(*path*[, *projection*])

Load camera track from file.

Parameters

- **path** (*str*) – Path to camera track file
- **projection** (*Metashape.CoordinateSystem*) – Camera track coordinate system.

loop

Loop track.

Type

bool

meta

Camera track meta data.

Type

Metashape.MetaData

save(*path*[, *file_format*][, *drone_name*][, *payload_name*][, *payload_position*][, *max_waypoints*][, *projection*])

Save camera track to file.

Parameters

- **path** (*str*) – Path to camera track file
- **file_format** (*str*) – File format. “deduce”: - Deduce from extension, “path”: Path, “earth”: Google Earth KML, “pilot”: DJI Pilot KML, “wpml”: DJI WPML KMZ, “trinity”: Asctec Trinity CSV, “autopilot”: Asctec Autopilot CSV, “litchi”: Litchi CSV
- **drone_name** (*str*) – Drone model. “M300 RTK”: - DJI Matrice 300 RTK, “M30”: - DJI Matrice 30, “M30T”: - DJI Matrice 30T, “M3E”: - DJI Mavic 3E, “M3T”: - DJI Mavic 3T
- **payload_name** (*str*) – Payload model. “P1 24mm”: - DJI Zenmuse P1 (24 mm lens), “P1 35mm”: - DJI Zenmuse P1 (35 mm lens), “P1 50mm”: - DJI Zenmuse P1 (50 mm lens), “H20”: - DJI Zenmuse H20, “H20T”: - DJI Zenmuse H20T, “H20N”: - DJI Zenmuse

H20N, “L1”: - DJI Zenmuse L1, “M30”: - DJI M30, “M30T”: - DJI M30T, “M3E”: - DJI Mavic 3E Camera, “M3T”: - DJI Mavic 3T Camera

- **payload_position** (*str*) – Payload position. For M300 RTK drone: “Front left”, “Front right”, “Top”. For other drones: “Main gimbal”
- **max_waypoints** (*int*) – Max waypoints per flight
- **projection** (`Metashape.CoordinateSystem`) – Camera track coordinate system.

selected

Current selection state.

Type

bool

smooth

Smooth path.

Type

bool

class Metashape.CamerasFormat

Camera orientation format in [CamerasFormatXML, CamerasFormatCHAN, CamerasFormatBoujou, CamerasFormatBundler, CamerasFormatOPK, CamerasFormatPATB, CamerasFormatBINGO, CamerasFormatORIMA, CamerasFormatAeroSys, CamerasFormatInpho, CamerasFormatSummit, CamerasFormatBlocksExchange, CamerasFormatRZML, CamerasFormatVisionMap, CamerasFormatABC, CamerasFormatFBX, CamerasFormatNVM, CamerasFormatMA, CamerasFormatColmap]

class Metashape.Chunk

A Chunk object:

- provides access to all chunk components (sensors, cameras, camera groups, markers, scale bars)
- contains data inherent to individual frames (tie points, model, etc)
- implements processing methods (matchPhotos, alignCameras, buildPointCloud, buildModel, etc)
- provides access to other chunk attributes (transformation matrix, coordinate system, meta-data, etc..)

New components can be created using corresponding addXXX methods (addSensor, addCamera, addCameraGroup, addMarker, addScalebar, addFrame). Removal of components is supported by a single remove method, which can accept lists of various component types.

In case of multi-frame chunks the Chunk object contains an additional reference to the particular chunk frame, initialized to the current frame by default. Various methods that work on a per frame basis (matchPhotos, buildModel, etc) are applied to this particular frame. A frames attribute can be used to obtain a list of Chunk objects that reference all available frames.

The following example performs image matching and alignment for the active chunk:

```
>>> import Metashape
>>> chunk = Metashape.app.document.chunk
>>> for frame in chunk.frames:
...     frame.matchPhotos(yscale=1)
>>> chunk.alignCameras()
```

addCamera([*sensor*])

Add new camera to the chunk.

Parameters

sensor (`Metashape.Sensor`) – Sensor to be assigned to this camera.

Returns

Created camera.

Return type

Metashape.Camera

addCameraGroup()

Add new camera group to the chunk.

Returns

Created camera group.

Return type

Metashape.CameraGroup

addCameraTrack()

Add new camera track to the chunk.

Returns

Created camera track.

Return type

Metashape.CameraTrack

addDepthMaps()

Add new depth maps set to the chunk.

Returns

Created depth maps set.

Return type

Metashape.DepthMaps

addElevation()

Add new elevation model to the chunk.

Returns

Created elevation model.

Return type

Metashape.Elevation

addFrame()

Add new frame to the chunk.

Returns

Created frame.

Return type

Metashape.Chunk

addFrames([*chunk*][, *frames*], *copy_depth_maps*=True, *copy_point_cloud*=True, *copy_model*=True, *copy_tiled_model*=True, *copy_elevation*=True, *copy_orthomosaic*=True[, *progress*])

Add frames from specified chunk.

Parameters

- **chunk** (*int*) – Chunk to copy frames from.
- **frames** (*list[int]*) – List of frame keys to copy.
- **copy_depth_maps** (*bool*) – Copy depth maps.

- **copy_point_cloud** (*bool*) – Copy point cloud.
- **copy_model** (*bool*) – Copy model.
- **copy_tiled_model** (*bool*) – Copy tiled model.
- **copy_elevation** (*bool*) – Copy DEM.
- **copy_orthomosaic** (*bool*) – Copy orthomosaic.
- **progress** (*Callable[[float], None]*) – Progress callback.

addMarker(*[point]*, *visibility=False*)

Add new marker to the chunk.

Parameters

- **point** (*Metashape.Vector*) – Point to initialize marker projections.
- **visibility** (*bool*) – Enables visibility check during projection assignment.

Returns

Created marker.

Return type

Metashape.Marker

addMarkerGroup()

Add new marker group to the chunk.

Returns

Created marker group.

Return type

Metashape.MarkerGroup

addModel()

Add new model to the chunk.

Returns

Created model.

Return type

Metashape.Model

addModelGroup()

Add new model group to the chunk.

Returns

Created model group.

Return type

Metashape.ModelGroup

addOrthomosaic()

Add new orthomosaic to the chunk.

Returns

Created orthomosaic.

Return type

Metashape.Orthomosaic

```
addPhotos([filenames][, filegroups], layout=UndefinedLayout[, group], strip_extensions=True,
           load_reference=True, load_xmp_calibration=True, load_xmp_orientation=True,
           load_xmp_accuracy=False, load_xmp_antenna=True, load_rpc_txt=False[, progress])
```

Add a list of photos to the chunk.

Parameters

- **filenames** (*list[str]*) – List of files to add.
- **filegroups** (*list[int]*) – List of file groups.
- **layout** (`Metashape.ImageLayout`) – Image layout.
- **group** (*int*) – Camera group key.
- **strip_extensions** (*bool*) – Strip file extensions from camera labels.
- **load_reference** (*bool*) – Load reference coordinates.
- **load_xmp_calibration** (*bool*) – Load calibration from XMP meta data.
- **load_xmp_orientation** (*bool*) – Load orientation from XMP meta data.
- **load_xmp_accuracy** (*bool*) – Load accuracy from XMP meta data.
- **load_xmp_antenna** (*bool*) – Load GNSS/INS offset from XMP meta data.
- **load_rpc_txt** (*bool*) – Load satellite RPC data from auxiliary TXT files.
- **progress** (*Callable[[float], None]*) – Progress callback.

```
addPointCloud()
```

Add new point cloud to the chunk.

Returns

Created point cloud.

Return type

Metashape.PointCloud

```
addPointCloudGroup()
```

Add new point cloud group to the chunk.

Returns

Created point cloud group.

Return type

Metashape.PointCloudGroup

```
addScalebar(point1, point2)
```

Add new scale bar to the chunk.

Parameters

- **point1** (`Metashape.Marker` / `Metashape.Camera`) – First endpoint.
- **point2** (`Metashape.Marker` / `Metashape.Camera`) – Second endpoint.

Returns

Created scale bar.

Return type

Metashape.Scalebar

addScalebarGroup()

Add new scale bar group to the chunk.

Returns

Created scale bar group.

Return type

Metashape.ScalebarGroup

addSensor([source])

Add new sensor to the chunk.

Parameters

source (*Metashape.Sensor*) – Sensor to copy parameters from.

Returns

Created sensor.

Return type

Metashape.Sensor

addTiledModel()

Add new tiled model to the chunk.

Returns

Created tiled model.

Return type

Metashape.TiledModel

addTrajectory()

Add new trajectory to the chunk.

Returns

Created trajectory.

Return type

Metashape.Trajectory

alignCameras([cameras][, point_clouds], min_image=2, adaptive_fitting=False, reset_alignment=False, subdivide_task=True, align_laser_scans=False[, progress])

Perform photo alignment for the chunk.

Parameters

- **cameras** (*list[int]*) – List of cameras to align.
- **point_clouds** (*list[int]*) – List of point clouds to align.
- **min_image** (*int*) – Minimum number of point projections.
- **adaptive_fitting** (*bool*) – Enable adaptive fitting of distortion coefficients.
- **reset_alignment** (*bool*) – Reset current alignment.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **align_laser_scans** (*bool*) – Align laser scans using geometric features.
- **progress** (*Callable[[float], None]*) – Progress callback.

alignCamerasByReference(*[cameras]*)

Use photo reference metadata as alignment.

Parameters

cameras (*list* [*Metashape.Camera*]) – Optional list of cameras to process.

analyzeImages(*[cameras]*, *filter_mask=False*, [*progress*])

Estimate image quality. Estimated value is stored in camera metadata with Image/Quality key. Cameras with quality less than 0.5 are considered blurred and we recommend to disable them.

Parameters

- **cameras** (*list* [*int*]) – List of cameras to be analyzed.
- **filter_mask** (*bool*) – Constrain analyzed image region by mask.
- **progress** (*Callable* [*float*], *None*) – Progress callback.

buildContours(*source_data=ElevationData*, *interval=1*, *min_value=-1e+10*, *max_value=1e+10*, *prevent_intersections=True*, [*progress*])

Build contours for the chunk.

Parameters

- **source_data** (*Metashape.DataSource*) – Source data for contour generation.
- **interval** (*float*) – Contour interval.
- **min_value** (*float*) – Minimum value of contour range.
- **max_value** (*float*) – Maximum value of contour range.
- **prevent_intersections** (*bool*) – Prevent contour intersections.
- **progress** (*Callable* [*float*], *None*) – Progress callback.

buildDem(*source_data=PointCloudData*, *interpolation=EnabledInterpolation*, [*projection*], [*region*], [*classes*], *flip_x=False*, *flip_y=False*, *flip_z=False*, *resolution=0*, *subdivide_task=True*, *workitem_size_tiles=10*, *max_workgroup_size=100*, *replace_asset=False*, [*frames*], [*progress*])

Build elevation model for the chunk.

Parameters

- **source_data** (*Metashape.DataSource*) – Selects between point cloud and tie points.
- **interpolation** (*Metashape.Interpolation*) – Interpolation mode.
- **projection** (*Metashape.OrthoProjection*) – Output projection.
- **region** (*Metashape.BBox*) – Region to be processed.
- **classes** (*list* [*int*]) – List of point classes to be used for surface extraction.
- **flip_x** (*bool*) – Flip X axis direction.
- **flip_y** (*bool*) – Flip Y axis direction.
- **flip_z** (*bool*) – Flip Z axis direction.
- **resolution** (*float*) – Output resolution in meters.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_tiles** (*int*) – Number of tiles in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.

- **replace_asset** (*bool*) – Replace default asset with generated DEM.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildDepthMaps(*downscale=4, filter_mode=MildFiltering*[, *cameras*], *reuse_depth=False, max_neighbors=16, subdivide_task=True, workitem_size_cameras=20, max_workgroup_size=100*[, *progress*])

Generate depth maps for the chunk.

Parameters

- **downscale** (*int*) – Depth map quality (1 - Ultra high, 2 - High, 4 - Medium, 8 - Low, 16 - Lowest).
- **filter_mode** (*Metashape.FilterMode*) – Depth map filtering mode.
- **cameras** (*list[int]*) – List of cameras to process.
- **reuse_depth** (*bool*) – Enable reuse depth maps option.
- **max_neighbors** (*int*) – Maximum number of neighbor images to use for depth map generation.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildModel(*surface_type=Arbitrary, interpolation=EnabledInterpolation, face_count=HighFaceCount, face_count_custom=200000, source_data=DepthMapsData*[, *classes*], *vertex_colors=True, vertex_confidence=True, volumetric_masks=False, keep_depth=True, replace_asset=False, split_in_blocks=False*[, *blocks_crs*], *blocks_size=250*[, *blocks_origin*], *clip_to_boundary=False, export_blocks=False, build_texture=True, output_folder=""*, *trimming_radius=10*[, *cameras*][, *frames*], *subdivide_task=True, workitem_size_cameras=20, max_workgroup_size=100*[, *progress*])

Generate model for the chunk frame.

Parameters

- **surface_type** (*Metashape.SurfaceType*) – Type of object to be reconstructed.
- **interpolation** (*Metashape.Interpolation*) – Interpolation mode.
- **face_count** (*Metashape.FaceCount*) – Target face count.
- **face_count_custom** (*int*) – Custom face count.
- **source_data** (*Metashape.DataSource*) – Selects between point cloud, tie points, depth maps and laser scans.
- **classes** (*list[int]*) – List of point classes to be used for surface extraction.
- **vertex_colors** (*bool*) – Enable vertex colors calculation.
- **vertex_confidence** (*bool*) – Enable vertex confidence calculation.
- **volumetric_masks** (*bool*) – Enable strict volumetric masking.
- **keep_depth** (*bool*) – Enable store depth maps option.
- **replace_asset** (*bool*) – Replace default asset with generated model.

- **split_in_blocks** (*bool*) – Split model in blocks.
- **blocks_crs** (`Metashape.CoordinateSystem`) – Blocks grid coordinate system.
- **blocks_size** (*float*) – Blocks size in coordinate system units.
- **blocks_origin** (`Metashape.Vector`) – Blocks grid origin.
- **clip_to_boundary** (*bool*) – Clip to boundary shapes.
- **export_blocks** (*bool*) – Export completed blocks.
- **build_texture** (*bool*) – Generate preview textures.
- **output_folder** (*str*) – Path to output folder.
- **trimming_radius** (*int*) – Trimming radius (no trimming if zero).
- **cameras** (*list[int]*) – List of cameras to process.
- **frames** (*list[int]*) – List of frames to process.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **progress** (`Callable[[float], None]`) – Progress callback.

buildOrthomosaic (*surface_data=ModelData, blending_mode=MosaicBlending, fill_holes=True, ghosting_filter=False, cull_faces=False, refine_seamlines=False*, *projection*, *region*, *resolution=0, resolution_x=0, resolution_y=0, flip_x=False, flip_y=False, flip_z=False, transfer_texture=False, use_occlusion_texture=False, use_point_cloud_intensity=False, subdivide_task=True, workitem_size_cameras=20, workitem_size_tiles=10, max_workgroup_size=100, replace_asset=False*, *frames*, *progress*)

Build orthomosaic for the chunk.

Parameters

- **surface_data** (`Metashape.DataSource`) – Orthorectification surface.
- **blending_mode** (`Metashape.BlendingMode`) – Orthophoto blending mode.
- **fill_holes** (*bool*) – Enable hole filling.
- **ghosting_filter** (*bool*) – Enable ghosting filter.
- **cull_faces** (*bool*) – Enable back-face culling.
- **refine_seamlines** (*bool*) – Refine seamlines based on image content.
- **projection** (`Metashape.OrthoProjection`) – Output projection.
- **region** (`Metashape.BBox`) – Region to be processed.
- **resolution** (*float*) – Pixel size in meters.
- **resolution_x** (*float*) – Pixel size in the X dimension in projected units.
- **resolution_y** (*float*) – Pixel size in the Y dimension in projected units.
- **flip_x** (*bool*) – Flip X axis direction.
- **flip_y** (*bool*) – Flip Y axis direction.
- **flip_z** (*bool*) – Flip Z axis direction.

- **transfer_texture** (*bool*) – Transfer model texture to orthomosaic.
- **use_occlusion_texture** (*bool*) – Use model occlusion texture.
- **use_point_cloud_intensity** (*bool*) – Use point cloud intensity as color source.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **workitem_size_tiles** (*int*) – Number of tiles in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **replace_asset** (*bool*) – Replace default asset with generated orthomosaic.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildPanorama(*blending_mode=MosaicBlending, ghosting_filter=False* [*rotation*] [*region*], *width=0, height=0* [*camera_groups*] [*frames*] [*progress*])

Generate spherical panoramas from camera stations.

Parameters

- **blending_mode** ([Metashape.BlendingMode](#)) – Panorama blending mode.
- **ghosting_filter** (*bool*) – Enable ghosting filter.
- **rotation** ([Metashape.Matrix](#)) – Panorama 3x3 orientation matrix.
- **region** ([Metashape.BBox](#)) – Region to be generated.
- **width** (*int*) – Width of output panorama.
- **height** (*int*) – Height of output panorama.
- **camera_groups** (*list[int]*) – List of camera groups to process.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildPointCloud(*source_data=DepthMapsData, point_colors=True, point_confidence=False, keep_depth=True, max_neighbors=100, uniform_sampling=True, points_spacing=0.1* [*asset*], *subdivide_task=True, workitem_size_cameras=20, max_workgroup_size=100, replace_asset=False* [*frames*] [*progress*])

Generate point cloud for the chunk.

Parameters

- **source_data** ([Metashape.DataSource](#)) – Source data to extract points from.
- **point_colors** (*bool*) – Enable point colors calculation.
- **point_confidence** (*bool*) – Enable point confidence calculation.
- **keep_depth** (*bool*) – Enable store depth maps option.
- **max_neighbors** (*int*) – Maximum number of neighbor images to use for depth map filtering.
- **uniform_sampling** (*bool*) – Enable uniform point sampling.
- **points_spacing** (*float*) – Desired point spacing (m).
- **asset** (*int*) – Asset to process.

- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **replace_asset** (*bool*) – Replace default asset with generated point cloud.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildSeamlines(*epsilon=1.5*[, *progress*])

Generate shapes for orthomosaic seamlines.

Parameters

- **epsilon** (*float*) – Contour simplification threshold.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildTexture(*blending_mode=MosaicBlending*, *texture_size=8192*, *fill_holes=True*, *ghosting_filter=True*[, *cameras*], *texture_type=DiffuseMap*, *source_data=ImagesData*[, *source_asset*], *transfer_texture=True*, *workitem_size_cameras=20*, *max_workgroup_size=100*, *anti_aliasing=1*[, *progress*])

Generate texture for the chunk.

Parameters

- **blending_mode** (*Metashape.BlendingMode*) – Texture blending mode.
- **texture_size** (*int*) – Texture page size.
- **fill_holes** (*bool*) – Enable hole filling.
- **ghosting_filter** (*bool*) – Enable ghosting filter.
- **cameras** (*list[int]*) – A list of cameras to be used for texturing.
- **texture_type** (*Metashape.Model.TextureType*) – Texture type.
- **source_data** (*Metashape.DataSource*) – Source data to create texture from.
- **source_asset** (*int*) – Source asset.
- **transfer_texture** (*bool*) – Transfer texture.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem (block model only).
- **max_workgroup_size** (*int*) – Maximum workgroup size (block model only).
- **anti_aliasing** (*int*) – Anti-aliasing coefficient for baking
- **progress** (*Callable[[float], None]*) – Progress callback.

buildTiledModel(*pixel_size=0*, *tile_size=256*, *source_data=DepthMapsData*, *face_count=20000*, *ghosting_filter=False*, *transfer_texture=False*, *keep_depth=True*, *merge=False*[, *operand_chunk*][, *operand_frame*][, *operand_asset*][, *classes*], *subdivide_task=True*, *workitem_size_cameras=20*, *max_workgroup_size=100*, *replace_asset=False*[, *frames*][, *progress*])

Build tiled model for the chunk.

Parameters

- **pixel_size** (*float*) – Target model resolution in meters.
- **tile_size** (*int*) – Size of tiles in pixels.

- **source_data** ([Metashape.DataSource](#)) – Selects between point cloud and mesh.
- **face_count** (*int*) – Number of faces per megapixel of texture resolution.
- **ghosting_filter** (*bool*) – Enable ghosting filter.
- **transfer_texture** (*bool*) – Transfer source model texture to tiled model.
- **keep_depth** (*bool*) – Enable store depth maps option.
- **merge** (*bool*) – Merge tiled model flag.
- **operand_chunk** (*int*) – Operand chunk key.
- **operand_frame** (*int*) – Operand frame key.
- **operand_asset** (*int*) – Operand asset key.
- **classes** (*list[int]*) – List of point classes to be used for surface extraction.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **replace_asset** (*bool*) – Replace default asset with generated tiled model.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

buildUV(*mapping_mode=GenericMapping, page_count=1, texture_size=8192, pixel_size=0[, camera][, progress]*)

Generate uv mapping for the model.

Parameters

- **mapping_mode** ([Metashape.MappingMode](#)) – Texture mapping mode.
- **page_count** (*int*) – Number of texture pages to generate.
- **texture_size** (*int*) – Expected size of texture page at texture generation step.
- **pixel_size** (*float*) – Texture resolution in meters.
- **camera** (*int*) – Camera to be used for texturing in CameraMapping mode.
- **progress** (*Callable[[float], None]*) – Progress callback.

calculatePointNormals(*point_neighbors=28[, point_cloud][, progress]*)

Calculate point cloud normals.

Parameters

- **point_neighbors** (*int*) – Number of point neighbors to use for normal estimation.
- **point_cloud** (*int*) – Point cloud key to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

calibrateColors(*source_data=ModelData, white_balance=False[, cameras][, progress]*)

Perform radiometric calibration.

Parameters

- **source_data** ([Metashape.DataSource](#)) – Source data for calibration.
- **white_balance** (*bool*) – Calibrate white balance.

- **cameras** (*list[int]*) – List of cameras to calibrate.
- **progress** (*Callable[[float], None]*) – Progress callback.

calibrateReflectance(*use_reflectance_panels=True, use_sun_sensor=False[, progress]*)

Calibrate reflectance factors based on calibration panels and/or sun sensor.

Parameters

- **use_reflectance_panels** (*bool*) – Use calibrated reflectance panels.
- **use_sun_sensor** (*bool*) – Apply irradiance sensor measurements.
- **progress** (*Callable[[float], None]*) – Progress callback.

camera_crs

Coordinate system used for camera reference data.

Type

Metashape.CoordinateSystem

camera_groups

List of camera groups in the chunk.

Type

list[Metashape.CameraGroup]

camera_location_accuracy

Expected accuracy of camera coordinates in meters.

Type

Metashape.Vector

camera_rotation_accuracy

Expected accuracy of camera orientation angles in degrees.

Type

Metashape.Vector

camera_track

Camera track.

Type

Metashape.CameraTrack

camera_tracks

List of camera tracks in the chunk.

Type

list[Metashape.CameraTrack]

cameras

List of Regular and Keyframe cameras in the chunk.

Type

list[Metashape.Camera]

cir_transform

CIR calibration matrix.

Type

Metashape.CirTransform

cleanModel(*criterion=ComponentSize, level=0*[, *model*][, *progress*])

Remove model faces based on specified criterion.

Parameters

- **criterion** ([Metashape.Model.Criterion](#)) – Model filtering criterion.
- **level** (*int*) – Filtering threshold in percents.
- **model** (*int*) – Model to filter.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

cleanTiePoints(*criterion=ReprojectionError, threshold=0*[, *progress*])

Remove tie points based on specified criterion.

Parameters

- **criterion** ([Metashape.TiePoints.Criterion](#)) – Tie points filtering criterion.
- **threshold** (*float*) – Filtering threshold.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

colorizeModel(*source_data=ImagesData*[, *model*][, *progress*])

Calculate vertex colors for the model.

Parameters

- **source_data** ([Metashape.DataSource](#)) – Source data to extract colors from.
- **model** (*int*) – Key of model to colorize.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

colorizePointCloud(*source_data=ImagesData*[, *point_cloud*], *replace_asset=False*[, *frames*],
workitem_size_cameras=20, max_workgroup_size=100, subdivide_task=True[,
progress])

Calculate point colors for the point cloud.

Parameters

- **source_data** ([Metashape.DataSource](#)) – Source data to extract colors from.
- **point_cloud** (*int*) – Point cloud key to colorize.
- **replace_asset** (*bool*) – Replace source point cloud with colorized one.
- **frames** (*list*[*int*]) – List of frames to process.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

component

Component.

Type

[Metashape.Component](#)

components

List of components in the chunk.

Type

list[*Metashape.Component*]

convertImages(*path*='{filename}.{fileext}', *use_initial_calibration*=False, *color_correction*=False, *merge_planes*=False, *update_gps_tags*=False[, *cameras*][, *image_compression*][, *progress*])

Convert images.

Parameters

- **path** (*str*) – Path to output file.
- **use_initial_calibration** (*bool*) – Transform to initial calibration.
- **color_correction** (*bool*) – Apply color correction.
- **merge_planes** (*bool*) – Merge multispectral images.
- **update_gps_tags** (*bool*) – Update GPS tags.
- **cameras** (*list[int]*) – List of cameras to process.
- **image_compression** (*Metashape.ImageCompression*) – Image compression parameters.
- **progress** (*Callable[[float], None]*) – Progress callback.

copy([, *frames*][, *items*], *keypoints*=True[, *cameras*][, *laser_scans*][, *progress*])

Make a copy of the chunk.

Parameters

- **frames** (*list[Metashape.Chunk]*) – Optional list of frames to be copied.
- **items** (*list[Metashape.DataSource]*) – A list of items to copy.
- **keypoints** (*bool*) – Copy key points data.
- **cameras** (*list[Metashape.Camera]*) – Optional list of cameras to be copied.
- **laser_scans** (*list[Metashape.PointCloud]*) – Optional list of laser scans to be copied.
- **progress** (*Callable[[float], None]*) – Progress callback.

Returns

Copy of the chunk.

Return type

Metashape.Chunk

crs

Coordinate system used for reference data.

Type

Metashape.CoordinateSystem

decimateModel(*face_count*=200000[, *model*], *apply_to_selection*=False, *replace_asset*=False[, *frames*][, *progress*])

Decimate the model to the specified face count.

Parameters

- **face_count** (*int*) – Target face count.
- **model** (*int*) – Model to process.
- **apply_to_selection** (*bool*) – Apply to selection.
- **replace_asset** (*bool*) – Replace source model with decimated model.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

depth_maps

Default depth maps set for the current frame.

Type

Metashape.DepthMaps

depth_maps_sets

List of depth maps sets for the current frame.

Type

list[Metashape.DepthMaps]

detectFiducials(*generate_masks=False, mask_dark_pixels=True, generic_detector=True, right_angle_detector=False, v_shape_detector=False, frame_detector=False, fiducials_position_corners=True, fiducials_position_sides=True[, cameras][[, frames][[, progress]]*)

Detect fiducial marks on film cameras.

Parameters

- **generate_masks** (*bool*) – Generate background masks.
- **mask_dark_pixels** (*bool*) – Mask out dark pixels near frame edge.
- **generic_detector** (*bool*) – Use generic detector.
- **right_angle_detector** (*bool*) – Use right angle detector.
- **v_shape_detector** (*bool*) – Detect V-shape fiducials.
- **frame_detector** (*bool*) – Detect frame.
- **fiducials_position_corners** (*bool*) – Search corners for fiducials.
- **fiducials_position_sides** (*bool*) – Search sides for fiducials.
- **cameras** (*list[int]*) – List of cameras to process.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

detectMarkers(*target_type=CircularTarget12bit, tolerance=50, filter_mask=False, inverted=False, noparity=False, maximum_residual=5, minimum_size=0, minimum_dist=5, merge_markers=False[, cameras][[, frames][[, progress]]*)

Create markers from coded targets.

Parameters

- **target_type** (*Metashape.TargetType*) – Type of targets.
- **tolerance** (*int*) – Detector tolerance (0 - 100).
- **filter_mask** (*bool*) – Ignore masked image regions.

- **inverted** (*bool*) – Detect markers on black background.
- **noparity** (*bool*) – Disable parity checking.
- **maximum_residual** (*float*) – Maximum residual for non-coded targets in pixels.
- **minimum_size** (*int*) – Minimum target radius in pixels to be detected (CrossTarget type only).
- **minimum_dist** (*int*) – Minimum distance between targets in pixels (CrossTarget type only).
- **merge_markers** (*bool*) – Merge detected targets with existing markers.
- **cameras** (*list[int]*) – List of cameras to process.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

detectPowerlines(*min_altitude=1, n_points_per_line=100, max_quantization_error=0.01, use_model=True[, progress]*)

Detect powerlines for the chunk.

Parameters

- **min_altitude** (*float*) – Minimum altitude for reconstructed powerlines.
- **n_points_per_line** (*int*) – Maximum number of vertices per detected line.
- **max_quantization_error** (*float*) – Maximum allowed distance between polyline and smooth continuous curve.
- **use_model** (*bool*) – Use model for visibility checks.
- **progress** (*Callable[[float], None]*) – Progress callback.

elevation

Default elevation model for the current frame.

Type

Metashape.Elevation

elevations

List of elevation models for the current frame.

Type

list[Metashape.Elevation]

enabled

Enables/disables the chunk.

Type

bool

euler_angles

Euler angles triplet used for rotation reference.

Type

Metashape.EulerAngles

```
exportCameras(path="", format=CamerasFormatXML[, crs], save_points=True, save_markers=False,
save_invalid_matches=False, save_absolute_paths=False, save_images=True,
save_masks=False, use_labels=False, use_initial_calibration=False,
convert_to_pinhole=False, image_path='{filename}_{filenum}.jpg', image_orientation=0[,
image_compression], binary=False[, cameras], bundler_save_list=True,
bundler_path_list='list.txt', bingo_save_image=True, bingo_save_itera=True,
bingo_save_geoin=True, bingo_save_gps=False, bingo_path_itera='itera.dat',
bingo_path_image='image.dat', bingo_path_geoin='geoin.dat',
bingo_path_gps='gps-imu.dat', chan_rotation_order=RotationOrderXYZ[, progress ])
```

Export point cloud and/or camera positions.

Parameters

- **path** (*str*) – Path to output file.
- **format** (`Metashape.CamerasFormat`) – Export format.
- **crs** (`Metashape.CoordinateSystem`) – Output coordinate system (except AgisoftXML format).
- **save_points** (*bool*) – Enables/disables export of automatic tie points.
- **save_markers** (*bool*) – Enables/disables export of manual matching points.
- **save_invalid_matches** (*bool*) – Enables/disables export of invalid image matches.
- **save_absolute_paths** (*bool*) – Save absolute image paths (BlocksExchange and RZML formats only).
- **save_images** (*bool*) – Enables/disables images export (Colmap format only).
- **save_masks** (*bool*) – Enables/disables image masks export (Colmap format only).
- **use_labels** (*bool*) – Enables/disables label based item identifiers.
- **use_initial_calibration** (*bool*) – Transform image coordinates to initial calibration.
- **convert_to_pinhole** (*bool*) – Transform images to pinhole model without distortions.
- **image_path** (*str*) – Image name template
- **image_orientation** (*int*) – Image coordinate system (0 - X right, 1 - X up, 2 - X left, 3 - X down).
- **image_compression** (`Metashape.ImageCompression`) – Image compression parameters.
- **binary** (*bool*) – Enables/disables binary encoding for selected format (Colmap and FBX formats only).
- **cameras** (*list[int]*) – List of cameras to export (except AgisoftXML format).
- **bundler_save_list** (*bool*) – Enables/disables export of Bundler image list file.
- **bundler_path_list** (*str*) – Path to Bundler image list file.
- **bingo_save_image** (*bool*) – Enables/disables export of BINGO IMAGE COORDINATE file.
- **bingo_save_itera** (*bool*) – Enables/disables export of BINGO ITERA file.
- **bingo_save_geoin** (*bool*) – Enables/disables export of BINGO GEO INPUT file.
- **bingo_save_gps** (*bool*) – Enables/disables export of BINGO GPS/IMU data.
- **bingo_path_itera** (*str*) – Path to BINGO ITERA file.

- **bingo_path_image** (*str*) – Path to BINGO IMAGE COORDINATE file.
- **bingo_path_geoin** (*str*) – Path to BINGO GEO INPUT file.
- **bingo_path_gps** (*str*) – Path to BINGO GPS/IMU file.
- **chan_rotation_order** (`Metashape.RotationOrder`) – Rotation order (CHAN format only).
- **progress** (`Callable[[float], None]`) – Progress callback.

exportMarkers(*path*="[, crs], *binary*=False[, *progress*])

Export markers.

Parameters

- **path** (*str*) – Path to output file.
- **crs** (`Metashape.CoordinateSystem`) – Output coordinate system.
- **binary** (*bool*) – Enables/disables binary encoding for selected format (if applicable).
- **progress** (`Callable[[float], None]`) – Progress callback.

exportModel(*path*="", *binary*=True, *precision*=6, *texture_format*=ImageFormatJPEG, *save_texture*=True, *save_uv*=True, *save_normals*=True, *save_colors*=True, *save_confidence*=False, *save_cameras*=True, *save_markers*=True, *save_udim*=False, *save_alpha*=False, *embed_texture*=False, *strip_extensions*=False, *raster_transform*=RasterTransformNone, *colors_rgb_8bit*=True, *gltf_y_up*=True, *comment*="", *save_comment*=True, *format*=ModelFormatNone[, *crs*][, *shift*], *clip_to_boundary*=True, *clip_to_region*=False, *clip_to_block*=False, *block_margin*=0.5, *save_metadata_xml*=False[, *model*][, *viewpoint*][, *progress*])

Export generated model for the chunk.

Parameters

- **path** (*str*) – Path to output model.
- **binary** (*bool*) – Enables/disables binary encoding (if supported by format).
- **precision** (*int*) – Number of digits after the decimal point (for text formats).
- **texture_format** (`Metashape.ImageFormat`) – Texture format.
- **save_texture** (*bool*) – Enables/disables texture export.
- **save_uv** (*bool*) – Enables/disables uv coordinates export.
- **save_normals** (*bool*) – Enables/disables export of vertex normals.
- **save_colors** (*bool*) – Enables/disables export of vertex colors.
- **save_confidence** (*bool*) – Enables/disables export of vertex confidence.
- **save_cameras** (*bool*) – Enables/disables camera export.
- **save_markers** (*bool*) – Enables/disables marker export.
- **save_udim** (*bool*) – Enables/disables UDIM texture layout.
- **save_alpha** (*bool*) – Enables/disables alpha channel export.
- **embed_texture** (*bool*) – Embeds texture inside the model file (if supported by format).
- **strip_extensions** (*bool*) – Strips camera label extensions during export.

- **raster_transform** (`Metashape.RasterTransformType`) – Raster band transformation.
- **colors_rgb_8bit** (`bool`) – Convert colors to 8 bit RGB.
- **gltf_y_up** (`bool`) – Enables/disables y-up axes notation used in glTF.
- **comment** (`str`) – Optional comment (if supported by selected format).
- **save_comment** (`bool`) – Enables/disables comment export.
- **format** (`Metashape.ModelFormat`) – Export format.
- **crs** (`Metashape.CoordinateSystem`) – Output coordinate system.
- **shift** (`Metashape.Vector`) – Optional shift to be applied to vertex coordinates.
- **clip_to_boundary** (`bool`) – Clip model to boundary shapes.
- **clip_to_region** (`bool`) – Clip model to chunk region.
- **clip_to_block** (`bool`) – Clip model to block region.
- **block_margin** (`float`) – Block margin (m).
- **save_metadata_xml** (`bool`) – Save metadata.xml file.
- **model** (`int`) – Model key to export.
- **viewpoint** (`Metashape.Viewpoint`) – Default view.
- **progress** (`Callable[[float], None]`) – Progress callback.

```
exportOrthophotos(path='{filename}.tif', [cameras], raster_transform=RasterTransformNone, [projection]  
[[region], resolution=0, resolution_x=0, resolution_y=0, save_kml=False,  
save_world=False, save_alpha=True, [image_compression], white_background=True,  
north_up=True, [progress])
```

Export orthophotos for the chunk.

Parameters

- **path** (`str`) – Path to output orthophoto.
- **cameras** (`list[int]`) – List of cameras to process.
- **raster_transform** (`Metashape.RasterTransformType`) – Raster band transformation.
- **projection** (`Metashape.OrthoProjection`) – Output projection.
- **region** (`Metashape.BBox`) – Region to be exported.
- **resolution** (`float`) – Output resolution in meters.
- **resolution_x** (`float`) – Pixel size in the X dimension in projected units.
- **resolution_y** (`float`) – Pixel size in the Y dimension in projected units.
- **save_kml** (`bool`) – Enable kml file generation.
- **save_world** (`bool`) – Enable world file generation.
- **save_alpha** (`bool`) – Enable alpha channel generation.
- **image_compression** (`Metashape.ImageCompression`) – Image compression parameters.
- **white_background** (`bool`) – Enable white background.

- **north_up** (*bool*) – Use north-up orientation for export.
- **progress** (*Callable[[float], None]*) – Progress callback.

```
exportPointCloud(path="", source_data=PointCloudData[, point_clouds ], binary=True,
    save_point_color=True, save_point_normal=True, save_point_intensity=True,
    save_point_classification=True, save_point_confidence=True,
    save_point_return_number=True, save_point_scan_angle=True,
    save_point_source_id=True, save_point_timestamp=True, save_point_index=True,
    raster_transform=RasterTransformNone, colors_rgb_8bit=True, comment="",
    save_comment=True, format=PointCloudFormatNone,
    image_format=ImageFormatJPEG[, crs ][, shift ][, region ], clip_to_boundary=True,
    clip_to_region=False, block_width=1000, block_height=1000, split_in_blocks=False[,
    classes ], save_images=False, compression=True, tileset_version='1.0',
    screen_space_error=16, folder_depth=5[, viewpoint ], subdivide_task=True[, progress
    ])
```

Export point cloud.

Parameters

- **path** (*str*) – Path to output file.
- **source_data** (*Metashape.DataSource*) – Selects between point cloud and tie points. If not specified, uses point cloud if available.
- **point_clouds** (*list[int]*) – Point cloud keys to export.
- **binary** (*bool*) – Enables/disables binary encoding for selected format (if applicable).
- **save_point_color** (*bool*) – Enables/disables export of point color.
- **save_point_normal** (*bool*) – Enables/disables export of point normal.
- **save_point_intensity** (*bool*) – Enables/disables export of point intensity.
- **save_point_classification** (*bool*) – Enables/disables export of point classification.
- **save_point_confidence** (*bool*) – Enables/disables export of point confidence.
- **save_point_return_number** (*bool*) – Enables/disables export of point return number.
- **save_point_scan_angle** (*bool*) – Enables/disables export of point scan angle.
- **save_point_source_id** (*bool*) – Enables/disables export of point source ID.
- **save_point_timestamp** (*bool*) – Enables/disables export of point timestamp.
- **save_point_index** (*bool*) – Enables/disables export of point row and column indices.
- **raster_transform** (*Metashape.RasterTransformType*) – Raster band transformation.
- **colors_rgb_8bit** (*bool*) – Convert colors to 8 bit RGB.
- **comment** (*str*) – Optional comment (if supported by selected format).
- **save_comment** (*bool*) – Enable comment export.
- **format** (*Metashape.PointCloudFormat*) – Export format.
- **image_format** (*Metashape.ImageFormat*) – Image data format.
- **crs** (*Metashape.CoordinateSystem*) – Output coordinate system.
- **shift** (*Metashape.Vector*) – Optional shift to be applied to point coordinates.
- **region** (*Metashape.BBox*) – Region to be exported.

- **clip_to_boundary** (*bool*) – Clip point cloud to boundary shapes.
- **clip_to_region** (*bool*) – Clip point cloud to chunk region.
- **block_width** (*float*) – Block width in meters.
- **block_height** (*float*) – Block height in meters.
- **split_in_blocks** (*bool*) – Enable tiled export.
- **classes** (*list[int]*) – List of point classes to be exported.
- **save_images** (*bool*) – Enable image export.
- **compression** (*bool*) – Enable compression (Cesium format only).
- **tileset_version** (*str*) – Cesium 3D Tiles format version to export (1.0 or 1.1).
- **screen_space_error** (*float*) – Target screen space error (Cesium format only).
- **folder_depth** (*int*) – Tileset subdivision depth (Cesium format only).
- **viewpoint** ([Metashape.Viewpoint](#)) – Default view.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **progress** (*Callable[[float], None]*) – Progress callback.

```
exportRaster(path="", format=RasterFormatTiles, image_format=ImageFormatNone,  
             raster_transform=RasterTransformNone[, projection ][, region ], resolution=0,  
             resolution_x=0, resolution_y=0, block_width=10000, block_height=10000,  
             split_in_blocks=False, width=0, height=0[, world_transform ], nodata_value=-32767,  
             save_kml=False, save_world=False, save_scheme=False, save_alpha=True,  
             image_description=""[, image_compression ], network_links=True, global_profile=False,  
             min_zoom_level=-1, max_zoom_level=-1, white_background=True, clip_to_boundary=True,  
             title='Orthomosaic', description='Generated by Agisoft Metashape',  
             source_data=OrthomosaicData[, asset ], north_up=True, tile_width=256, tile_height=256[,  
             progress ])
```

Export DEM or orthomosaic to file.

Parameters

- **path** (*str*) – Path to output orthomosaic.
- **format** ([Metashape.RasterFormat](#)) – Export format.
- **image_format** ([Metashape.ImageFormat](#)) – Tile format.
- **raster_transform** ([Metashape.RasterTransformType](#)) – Raster band transformation.
- **projection** ([Metashape.OrthoProjection](#)) – Output projection.
- **region** ([Metashape.BBox](#)) – Region to be exported.
- **resolution** (*float*) – Output resolution in meters.
- **resolution_x** (*float*) – Pixel size in the X dimension in projected units.
- **resolution_y** (*float*) – Pixel size in the Y dimension in projected units.
- **block_width** (*int*) – Raster block width in pixels.
- **block_height** (*int*) – Raster block height in pixels.
- **split_in_blocks** (*bool*) – Split raster in blocks.
- **width** (*int*) – Raster width.

- **height** (*int*) – Raster height.
- **world_transform** (`Metashape.Matrix`) – 2x3 raster-to-world transformation matrix.
- **nodata_value** (*float*) – No-data value (DEM export only).
- **save_kml** (*bool*) – Enable kml file generation.
- **save_world** (*bool*) – Enable world file generation.
- **save_scheme** (*bool*) – Enable tile scheme files generation.
- **save_alpha** (*bool*) – Enable alpha channel generation.
- **image_description** (*str*) – Optional description to be added to image files.
- **image_compression** (`Metashape.ImageCompression`) – Image compression parameters.
- **network_links** (*bool*) – Enable network links generation for KMZ format.
- **global_profile** (*bool*) – Use global profile (GeoPackage and TMS formats only).
- **min_zoom_level** (*int*) – Minimum zoom level (GeoPackage, Google Map Tiles, MBTiles and World Wind Tiles formats only).
- **max_zoom_level** (*int*) – Maximum zoom level (GeoPackage, Google Map Tiles, MBTiles and World Wind Tiles formats only).
- **white_background** (*bool*) – Enable white background.
- **clip_to_boundary** (*bool*) – Clip raster to boundary shapes.
- **title** (*str*) – Export title.
- **description** (*str*) – Export description.
- **source_data** (`Metashape.DataSource`) – Selects between DEM and orthomosaic.
- **asset** (*int*) – Asset key to export.
- **north_up** (*bool*) – Use north-up orientation for export.
- **tile_width** (*int*) – Tile width in pixels.
- **tile_height** (*int*) – Tile height in pixels.
- **progress** (`Callable[[float], None]`) – Progress callback.

exportReference(*path*=" ", *format*=`ReferenceFormatNone`, *items*=`ReferenceItemsCameras`, *columns*=" ", *delimiter*=' ', *precision*=6, *save_rotation*=`True`, *save_location_accuracy*=`False`, *save_rotation_accuracy*=`False`, *save_errors*=`True`, *save_estimated*=`True`, *save_variance*=`False`, *save_enabled*=`False`[, *progress*])

Export reference data to the specified file.

Parameters

- **path** (*str*) – Path to the output file.
- **format** (`Metashape.ReferenceFormat`) – Export format.
- **items** (`Metashape.ReferenceItems`) – Items to export (CSV format only).
- **columns** (*str*) – Column order in CSV format (n - label, o - enabled flag, x/y/z - coordinates, X/Y/Z - coordinate accuracy, a/b/c - rotation angles, A/B/C - rotation angle accuracy, u/v/w - estimated coordinates, U/V/W - coordinate errors, d/e/f - estimated orientation angles, D/E/F - orientation errors, p/q/r - estimated coordinates variance, i/j/k - estimated orientation angles variance, [] - group of multiple values, | - column separator within group).

- **delimiter** (*str*) – Column delimiter (CSV format only).
- **precision** (*int*) – Number of digits after the decimal point (CSV format only).
- **save_rotation** (*bool*) – Save rotation angles (CSV format only).
- **save_location_accuracy** (*bool*) – Save location accuracy (CSV format only).
- **save_rotation_accuracy** (*bool*) – Save rotation accuracy (CSV format only).
- **save_errors** (*bool*) – Save errors (CSV format only).
- **save_estimated** (*bool*) – Save estimated values (CSV format only).
- **save_variance** (*bool*) – Save variance (CSV format only).
- **save_enabled** (*bool*) – Save enabled flag (CSV format only).
- **progress** (*Callable[[float], None]*) – Progress callback.

exportReport(*path=""*, *title=""*, *description=""*, *font_size=12*, *page_numbers=True*,
include_system_info=True[, *user_settings*], *logo_path=""*[, *progress*])

Export processing report in PDF format.

Parameters

- **path** (*str*) – Path to output report.
- **title** (*str*) – Report title.
- **description** (*str*) – Report description.
- **font_size** (*int*) – Font size (pt).
- **page_numbers** (*bool*) – Enable page numbers.
- **include_system_info** (*bool*) – Include system information.
- **user_settings** (*list[tuple[*str*, *str*]]*) – A list of user defined settings to include on the Processing Parameters page.
- **logo_path** (*str*) – Path to company logo file.
- **progress** (*Callable[[float], None]*) – Progress callback.

exportShapes(*path=""*, *save_points=False*, *save_polylines=False*, *save_polygons=False*[, *groups*],
format=ShapesFormatNone[, *crs*] [, *shift*], *polygons_as_polylines=False*, *save_labels=True*,
save_attributes=True, *save_elevation=True*[, *progress*])

Export shapes layer to file.

Parameters

- **path** (*str*) – Path to shape file.
- **save_points** (*bool*) – Export points.
- **save_polylines** (*bool*) – Export polylines.
- **save_polygons** (*bool*) – Export polygons.
- **groups** (*list[int]*) – A list of shape groups to export.
- **format** ([Metashape.ShapesFormat](#)) – Export format.
- **crs** ([Metashape.CoordinateSystem](#)) – Output coordinate system.
- **shift** ([Metashape.Vector](#)) – Optional shift to be applied to vertex coordinates.
- **polygons_as_polylines** (*bool*) – Save polygons as polylines.

- **save_labels** (*bool*) – Export labels.
- **save_attributes** (*bool*) – Export attributes.
- **save_elevation** (*bool*) – Export elevation values for 3D shapes.
- **progress** (*Callable[[float], None]*) – Progress callback.

exportTexture(*path=""*, *texture_type=DiffuseMap*, *raster_transform=RasterTransformNone*, *save_alpha=False*[, *progress*])

Export model texture to file.

Parameters

- **path** (*str*) – Path to output file.
- **texture_type** (*Metashape.Model.TextureType*) – Texture type.
- **raster_transform** (*Metashape.RasterTransformType*) – Raster band transformation.
- **save_alpha** (*bool*) – Enable alpha channel export.
- **progress** (*Callable[[float], None]*) – Progress callback.

exportTiledModel(*path=""*, *format=TiledModelFormatNone*, *model_format=ModelFormatCOLLADA*, *texture_format=ImageFormatJPEG*, *raster_transform=RasterTransformNone*[, *image_compression*] [, *crs*], *clip_to_boundary=True*, *clip_to_region=False*[, *tiled_model*], *model_compression=True*, *zip_compression=True*, *tileset_version='1.0'*, *use_tileset_transform=True*, *screen_space_error=16*, *folder_depth=5*[, *model_group*], *pixel_size=0*, *tile_size=256*, *face_count=20000*[, *progress*])

Export generated tiled model for the chunk.

Parameters

- **path** (*str*) – Path to output model.
- **format** (*Metashape.TiledModelFormat*) – Export format.
- **model_format** (*Metashape.ModelFormat*) – Model format for zip export.
- **texture_format** (*Metashape.ImageFormat*) – Texture format.
- **raster_transform** (*Metashape.RasterTransformType*) – Raster band transformation.
- **image_compression** (*Metashape.ImageCompression*) – Image compression parameters.
- **crs** (*Metashape.CoordinateSystem*) – Output coordinate system.
- **clip_to_boundary** (*bool*) – Clip tiled model to boundary shapes.
- **clip_to_region** (*bool*) – Clip tiled model to chunk region.
- **tiled_model** (*int*) – Tiled model key to export.
- **model_compression** (*bool*) – Enable mesh compression (Cesium format only).
- **zip_compression** (*bool*) – Enable zip compression (Cesium format only).
- **tileset_version** (*str*) – Cesium 3D Tiles format version to export (1.0 or 1.1).
- **use_tileset_transform** (*bool*) – Use tileset transform instead of individual tile transforms (Cesium format only).
- **screen_space_error** (*float*) – Target screen space error (Cesium format only).

- **folder_depth** (*int*) – Tileset subdivision depth (Cesium format only).
- **model_group** (*int*) – Block model key to export.
- **pixel_size** (*float*) – Target model resolution in meters (block model export only).
- **tile_size** (*int*) – Size of tiles in pixels (block model export only).
- **face_count** (*int*) – Number of faces per megapixel of texture resolution (block model export only).
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

filterPointCloud(*point_spacing=0*[, *point_cloud*], *clip_to_region=False*, *replace_asset=False*[, *frames*][, *progress*])

Reduce point cloud points number.

Parameters

- **point_spacing** (*float*) – Desired point spacing (m).
- **point_cloud** (*int*) – Point cloud key to filter.
- **clip_to_region** (*bool*) – Clip point cloud to chunk region.
- **replace_asset** (*bool*) – Replace default asset with filtered point cloud.
- **frames** (*list*[*int*]) – List of frames to process.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

findCamera(*key*)

Find camera by its key.

Returns

Found camera.

Return type

Metashape.Camera

findCameraGroup(*key*)

Find camera group by its key.

Returns

Found camera group.

Return type

Metashape.CameraGroup

findCameraTrack(*key*)

Find camera track by its key.

Returns

Found camera track.

Return type

Metashape.CameraTrack

findDepthMaps(*key*)

Find depth maps by its key.

Returns

Found depth maps.

Return type

Metashape.DepthMaps

findElevation(*key*)

Find elevation model by its key.

Returns

Found elevation model.

Return type

Metashape.Elevation

findFrame(*key*)

Find frame by its key.

Returns

Found frame.

Return type

Metashape.Chunk

findMarker(*key*)

Find marker by its key.

Returns

Found marker.

Return type

Metashape.Marker

findMarkerGroup(*key*)

Find marker group by its key.

Returns

Found marker group.

Return type

Metashape.MarkerGroup

findModel(*key*)

Find model by its key.

Returns

Found model.

Return type

Metashape.Model

findModelGroup(*key*)

Find model group by its key.

Parameters

key (*int*) – Model group key.

Returns

Found model group.

Return type

Metashape.ModelGroup

findOrthomosaic(*key*)

Find orthomosaic by its key.

Returns

Found orthomosaic.

Return type

Metashape.Orthomosaic

findPointCloud(*key*)

Find point cloud by its key.

Returns

Found point cloud.

Return type

Metashape.PointCloud

findPointCloudGroup(*key*)

Find point cloud group by its key.

Parameters

key (*int*) – Point cloud group key.

Returns

Found point cloud group.

Return type

Metashape.PointCloudGroup

findScalebar(*key*)

Find scalebar by its key.

Returns

Found scalebar.

Return type

Metashape.Scalebar

findScalebarGroup(*key*)

Find scalebar group by its key.

Returns

Found scalebar group.

Return type

Metashape.ScalebarGroup

findSensor(*key*)

Find sensor by its key.

Returns

Found sensor.

Return type

Metashape.Sensor

findTiledModel(*key*)

Find tiled model by its key.

Returns

Found tiled model.

Return type*Metashape.TiledModel***findTrajectory**(*key*)

Find trajectory by its key.

Returns

Found trajectory.

Return type*Metashape.Trajectory***frame**

Current frame index.

Type

int

frames

List of frames in the chunk.

Typelist[*Metashape.Chunk*]

generateMasks(*path*='{filename}_mask.png', *masking_mode*=*MaskingModeAlpha*,
mask_operation=*MaskOperationReplacement*, *tolerance*=10[, *cameras*],
replace_asset=True[, *frames*], *mask_defocus*=False, *fix_coverage*=True, *blur_threshold*=3,
depth_threshold=3.40282e+38[, *progress*])

Generate masks for multiple cameras.

Parameters

- **path** (*str*) – Mask file name template.
- **masking_mode** (*Metashape.MaskingMode*) – Mask generation mode.
- **mask_operation** (*Metashape.MaskOperation*) – Mask operation.
- **tolerance** (*int*) – Background masking tolerance.
- **cameras** (*list[int]*) – Optional list of cameras to be processed.
- **replace_asset** (*bool*) – Update default set of masks with generated masks.
- **frames** (*list[int]*) – List of frames to process.
- **mask_defocus** (*bool*) – Mask defocus areas.
- **fix_coverage** (*bool*) – Extend masks to cover whole mesh (only if *mask_defocus*=True).
- **blur_threshold** (*float*) – Allowed blur radius on a photo in pix (only if *mask_defocus*=True).
- **depth_threshold** (*float*) – Maximum depth of masked areas in meters (only if *mask_defocus*=False).
- **progress** (*Callable[[float], None]*) – Progress callback.

generatePrescriptionMap(*class_count*=4, *cell_size*=1,
classification_method=*JenksNaturalBreaksClassification* [,
boundary_shape_group][, *breakpoints*][, *rates*][, *progress*])

Generate prescription map for orthomosaic.

Parameters

- **class_count** (*int*) – Number of classes.
- **cell_size** (*float*) – Step of prescription grid, meters.
- **classification_method** (`Metashape.ClassificationMethod`) – Index values classification method.
- **boundary_shape_group** (*int*) – Boundary shape group.
- **breakpoints** (*list[*float*]*) – Classification breakpoints.
- **rates** (*list[*float*]*) – Fertilizer rate for each class.
- **progress** (*Callable[[*float*], None]*) – Progress callback.

image_brightness

Image brightness as percentage.

Type

float

image_contrast

Image contrast as percentage.

Type

float

```
importCameras(path="", format=CamerasFormatXML[, crs ], image_orientation=0, image_list='list.txt',  
              load_image_list=False[, progress ])
```

Import camera positions.

Parameters

- **path** (*str*) – Path to the file.
- **format** (`Metashape.CamerasFormat`) – File format.
- **crs** (`Metashape.CoordinateSystem`) – Ground coordinate system.
- **image_orientation** (*int*) – Image coordinate system (0 - X right, 1 - X up, 2 - X left, 3 - X down).
- **image_list** (*str*) – Path to image list file (Bundler format only).
- **load_image_list** (*bool*) – Enable Bundler image list import.
- **progress** (*Callable[[*float*], None]*) – Progress callback.

```
importDepthImages(format=PointCloudFormatNone[, filenames ][, color_filenames ], image_path="",  
                  multiplane=False[, progress ])
```

Import images with depth data.

Parameters

- **format** (`Metashape.PointCloudFormat`) – Point cloud format.
- **filenames** (*list[*str*]*) – List of files to import. Either smartphone depth photos or depth images with corresponding color images in `color_filenames` parameter.
- **color_filenames** (*list[*str*]*) – List of corresponding color files, if present.
- **image_path** (*str*) – Path template to output pre-processed files.
- **multiplane** (*bool*) – Import as a multi-camera system
- **progress** (*Callable[[*float*], None]*) – Progress callback.

importMarkers(*path*="[, *progress*]

Import markers.

Parameters

- **path** (*str*) – Path to the file.
- **progress** (*Callable*[*float*], *None*) – Progress callback.

importModel(*path*=" , *format*=*ModelFormatNone*[, *crs*] [, *shift*] , *decode_udim*=*True* ,
replace_asset=*False* [, *frame_paths*] [, *progress*])

Import model from file.

Parameters

- **path** (*str*) – Path to model.
- **format** (*Metashape.ModelFormat*) – Model format.
- **crs** (*Metashape.CoordinateSystem*) – Model coordinate system.
- **shift** (*Metashape.Vector*) – Optional shift to be applied to vertex coordinates.
- **decode_udim** (*bool*) – Load UDIM texture layout.
- **replace_asset** (*bool*) – Replace default asset with imported model.
- **frame_paths** (*list* [*str*]) – List of model paths to import in each frame of a multiframe chunk.
- **progress** (*Callable*[*float*], *None*) – Progress callback.

importPointCloud(*path*=" , *format*=*PointCloudFormatNone*[, *crs*] [, *shift*] , *precision*=0 , *columns*='xyz' ,
delimiter=' ' , *group_delimiters*=*False* , *skip_rows*=0 , *is_laser_scan*=*False* ,
replace_asset=*False* , *load_point_color*=*True* , *load_point_normal*=*True* ,
load_point_intensity=*True* , *load_point_classification*=*True* ,
load_point_confidence=*True* , *load_point_return_number*=*True* ,
load_point_scan_angle=*True* , *load_point_source_id*=*True* ,
load_point_timestamp=*True* , *load_point_index*=*True* , *load_images*=*True* ,
generate_panorama=*True* , *calculate_normals*=*True* , *point_neighbors*=28 ,
scanner_at_origin=*False* , *ignore_scanner_origin*=*False* , *ignore_trajectory*=*False* [,
trajectory] [, *frame_paths*] [, *progress*])

Import point cloud from file.

Parameters

- **path** (*str*) – Path to point cloud.
- **format** (*Metashape.PointCloudFormat*) – Point cloud format.
- **crs** (*Metashape.CoordinateSystem*) – Point cloud coordinate system.
- **shift** (*Metashape.Vector*) – Optional shift to be applied to point coordinates.
- **precision** (*float*) – Coordinate precision (m). For default precision use 0.
- **columns** (*str*) – Column order (x/y/z - coordinates, X/Y/Z - normal, r/g/b - color, i - intensity, t - time, c - classification, space - skip column).
- **delimiter** (*str*) – CSV delimiter.
- **group_delimiters** (*bool*) – Combine consecutive delimiters in csv format.
- **skip_rows** (*int*) – Number of rows to skip.
- **is_laser_scan** (*bool*) – Import point clouds as laser scans.

- **replace_asset** (*bool*) – Replace default asset with imported point cloud.
- **load_point_color** (*bool*) – Import point color.
- **load_point_normal** (*bool*) – Import point normal.
- **load_point_intensity** (*bool*) – Import point intensity.
- **load_point_classification** (*bool*) – Import point classification.
- **load_point_confidence** (*bool*) – Import point confidence.
- **load_point_return_number** (*bool*) – Import point return number.
- **load_point_scan_angle** (*bool*) – Import point scan angle.
- **load_point_source_id** (*bool*) – Import point source ID.
- **load_point_timestamp** (*bool*) – Import point timestamp.
- **load_point_index** (*bool*) – Import point row and column indices.
- **load_images** (*bool*) – Import images embedded in laser scan.
- **generate_panorama** (*bool*) – Generate panorama from point colors.
- **calculate_normals** (*bool*) – Calculate point normals.
- **point_neighbors** (*int*) – Number of point neighbors to use for normal estimation.
- **scanner_at_origin** (*bool*) – Use laser scan origin as scanner position for unstructured point clouds.
- **ignore_scanner_origin** (*bool*) – Do not use laser scan origin as scanner position for structured point clouds.
- **ignore_trajectory** (*bool*) – Do not attach trajectory to imported point cloud.
- **trajectory** (*int*) – Trajectory key to attach.
- **frame_paths** (*list[str]*) – List of point cloud paths to import in each frame of a multi-frame chunk.
- **progress** (*Callable[[float], None]*) – Progress callback.

importRaster(*path*="[*crs*], *raster_type*=*ElevationData*, *nodata_value*=-32767, *has_nodata_value*=*False*, *replace_asset*=*False*[, *frames*][, *progress*])

Import DEM or orthomosaic from file.

Parameters

- **path** (*str*) – Path to elevation model in GeoTIFF format.
- **crs** (*Metashape.CoordinateSystem*) – Default coordinate system if not specified in GeoTIFF file.
- **raster_type** (*Metashape.DataSource*) – Type of raster layer to import.
- **nodata_value** (*float*) – No-data value.
- **has_nodata_value** (*bool*) – No-data value valid flag.
- **replace_asset** (*bool*) – Replace default raster with imported one.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

```
importReference(path="", format=ReferenceFormatCSV, columns="", delimiter=",", group_delimiters=False,
                skip_rows=0, items=ReferenceItemsAll[, crs ], rotation_angles=EulerAnglesUndefined,
                create_markers=False, ignore_labels=False, threshold=0.1, load_rotation=True,
                load_location_accuracy=False, load_rotation_accuracy=False, load_enabled=False,
                column_enabled=10, column_label=1, column_x=2, column_y=3, column_z=4,
                column_sx=8, column_sy=8, column_sz=8, column_a=5, column_b=6, column_c=7,
                column_sa=9, column_sb=9, column_sc=9, shutter_lag=0[, progress ])
```

Import reference data from the specified file.

Parameters

- **path** (*str*) – Path to the file with reference data.
- **format** (`Metashape.ReferenceFormat`) – File format.
- **columns** (*str*) – Column order in CSV format (n - label, o - enabled flag, x/y/z - coordinates, X/Y/Z - coordinate accuracy, a/b/c - rotation angles, A/B/C - rotation angle accuracy, [] - group of multiple values, | - column separator within group).
- **delimiter** (*str*) – Column delimiter (CSV format only).
- **group_delimiters** (*bool*) – Combine consecutive delimiters (CSV format only).
- **skip_rows** (*int*) – Number of rows to skip (CSV format only).
- **items** (`Metashape.ReferenceItems`) – Items to load reference for (CSV format only).
- **crs** (`Metashape.CoordinateSystem`) – Reference data coordinate system (CSV format only).
- **rotation_angles** (`Metashape.EulerAngles`) – Euler angles triplet used for rotation reference (CSV format only).
- **create_markers** (*bool*) – Create markers for missing entries (CSV format only).
- **ignore_labels** (*bool*) – Matches reference data based on coordinates alone (CSV format only).
- **threshold** (*float*) – Error threshold in meters used when `ignore_labels` is set (CSV format only).
- **load_rotation** (*bool*) – Load rotation angles (CSV format only).
- **load_location_accuracy** (*bool*) – Load location accuracy (CSV format only).
- **load_rotation_accuracy** (*bool*) – Load rotation accuracy (CSV format only).
- **load_enabled** (*bool*) – Load enabled flag (CSV format only).
- **column_enabled** (*int*) – Enabled flag column (CSV format only).
- **column_label** (*int*) – Label column (CSV format only).
- **column_x** (*int*) – X coordinate column (CSV format only).
- **column_y** (*int*) – Y coordinate column (CSV format only).
- **column_z** (*int*) – Z coordinate column (CSV format only).
- **column_sx** (*int*) – X coordinate accuracy column (CSV format only).
- **column_sy** (*int*) – Y coordinate accuracy column (CSV format only).
- **column_sz** (*int*) – Z coordinate accuracy column (CSV format only).
- **column_a** (*int*) – 1st rotation angle column (CSV format only).

- **column_b** (*int*) – 2nd rotation angle column (CSV format only).
- **column_c** (*int*) – 3rd rotation angle column (CSV format only).
- **column_sa** (*int*) – 1st rotation angle accuracy column (CSV format only).
- **column_sb** (*int*) – 2nd rotation angle accuracy column (CSV format only).
- **column_sc** (*int*) – 3rd rotation angle accuracy column (CSV format only).
- **shutter_lag** (*float*) – Shutter lag in seconds (APM format only).
- **progress** (*Callable[[float], None]*) – Progress callback.

```
importShapes(path="", replace=False, boundary_type=None, format=ShapesFormatNone,  
             columns='xyzd', delimiter='', group_delimiters=False, skip_rows=0[, crs][, progress ])
```

Import shapes layer from file.

Parameters

- **path** (*str*) – Path to shape file.
- **replace** (*bool*) – Replace current shapes with new data.
- **boundary_type** (*Metashape.Shape.BoundaryType*) – Boundary type to be applied to imported shapes.
- **format** (*Metashape.ShapesFormat*) – Shapes format.
- **columns** (*str*) – Column order in csv format (n - label, x/y/z - coordinates, d - description, [] - group of multiple values, | - column separator within group).
- **delimiter** (*str*) – Column delimiter in csv format.
- **group_delimiters** (*bool*) – Combine consecutive delimiters in csv format.
- **skip_rows** (*int*) – Number of rows to skip in (csv format only).
- **crs** (*Metashape.CoordinateSystem*) – Reference data coordinate system (csv format only).
- **progress** (*Callable[[float], None]*) – Progress callback.

```
importTiledModel(path=""[, progress ])
```

Import tiled model from file.

Parameters

- **path** (*str*) – Path to tiled model.
- **progress** (*Callable[[float], None]*) – Progress callback.

```
importTrajectory(path="", format=TrajectoryFormatNone, columns='xyz', delimiter='',  
                group_delimiters=False, skip_rows=0[, crs][, shift ], replace_asset=False[, progress  
                ])
```

Import trajectory from file.

Parameters

- **path** (*str*) – Trajectory file path.
- **format** (*Metashape.TrajectoryFormat*) – Trajectory format.
- **columns** (*str*) – Column order in csv format (t - time, x/y/z - coordinates, a/b/c - rotation angles, space - skip column).
- **delimiter** (*str*) – Column delimiter in csv format.

- **group_delimiters** (*bool*) – Combine consecutive delimiters in csv format.
- **skip_rows** (*int*) – Number of rows to skip in (csv format only).
- **crs** ([Metashape.CoordinateSystem](#)) – Point cloud coordinate system.
- **shift** ([Metashape.Vector](#)) – Optional shift to be applied to point coordinates.
- **replace_asset** (*bool*) – Replace default asset with imported trajectory.
- **progress** (*Callable[[float], None]*) – Progress callback.

importVideo(*path=""*, *image_path=""*, *frame_step=CustomFrameStep*, *custom_frame_step=1*, *time_start=0*, *time_end=-1*[, *progress*])

Import video frames from file.

Parameters

- **path** (*str*) – Path to source video.
- **image_path** (*str*) – Path to directory where to save frames with filename template. For example: /path/to/dir/frame{filenum}.png.
- **frame_step** ([Metashape.FrameStep](#)) – Frame step type.
- **custom_frame_step** (*int*) – Every custom_frame_step'th frame will be saved. Used for frame_step=CustomFrameStep.
- **time_start** (*float*) – The starting point for importing video, seconds.
- **time_end** (*float*) – The endpoint for importing video, seconds.
- **progress** (*Callable[[float], None]*) – Progress callback.

key

Chunk identifier.

Type

int

label

Chunk label.

Type

str

loadReferenceExif(*load_rotation=False*, *load_accuracy=False*)

Import camera locations from EXIF meta data.

Parameters

- **load_rotation** (*bool*) – Load yaw, pitch and roll orientation angles.
- **load_accuracy** (*bool*) – Load camera location accuracy.

loadReflectancePanelCalibration(*path*[, *cameras*])

Load reflectance panel calibration from CSV file.

Parameters

- **path** (*str*) – Path to calibration file.
- **cameras** (*list* [[Metashape.Camera](#)]) – List of cameras to process.

locateReflectancePanels(*[progress]*)

Locate reflectance panels based on QR-codes.

Parameters

progress (*Callable[[float], None]*) – Progress callback.

marker_crs

Coordinate system used for marker reference data.

Type

Metashape.CoordinateSystem

marker_groups

List of marker groups in the chunk.

Type

list[*Metashape.MarkerGroup*]

marker_location_accuracy

Expected accuracy of marker coordinates in meters.

Type

Metashape.Vector

marker_projection_accuracy

Expected accuracy of marker projections in pixels.

Type

float

markers

List of Regular, Vertex and Fiducial markers in the chunk.

Type

list[*Metashape.Marker*]

mask_sets

List of mask sets for the current frame.

Type

list[*Metashape.Masks*]

masks

Image masks.

Type

Metashape.Masks

matchPhotos(*downscale=1, downscale_3d=1, generic_preselection=True, reference_preselection=True, reference_preselection_mode=ReferencePreselectionSource, filter_mask=False, mask_tiepoints=True, filter_stationary_points=True, keypoint_limit=40000, keypoint_limit_3d=100000, keypoint_limit_per_mpx=1000, tiepoint_limit=4000, keep_keypoints=False[, pairs][, cameras], guided_matching=False, reset_matches=False, subdivide_task=True, workitem_size_cameras=20, workitem_size_pairs=80, max_workgroup_size=100, laser_scans_vertical_axis=0, laser_scans_use_initial_orientation=False, match_laser_scans=False[, progress]*)

Perform image matching for the chunk frame.

Parameters

- **downscale** (*int*) – Image alignment accuracy (0 - Highest, 1 - High, 2 - Medium, 4 - Low, 8 - Lowest).
- **downscale_3d** (*int*) – Laser scan alignment accuracy (1 - Highest, 2 - High, 4 - Medium, 8 - Low, 16 - Lowest).
- **generic_preselection** (*bool*) – Enable generic preselection.
- **reference_preselection** (*bool*) – Enable reference preselection.
- **reference_preselection_mode** (`Metashape.ReferencePreselectionMode`) – Reference preselection mode.
- **filter_mask** (*bool*) – Filter points by mask.
- **mask_tiepoints** (*bool*) – Apply mask filter to tie points.
- **filter_stationary_points** (*bool*) – Exclude tie points which are stationary across images.
- **keypoint_limit** (*int*) – Key point limit.
- **keypoint_limit_3d** (*int*) – Key point limit for laser scans.
- **keypoint_limit_per_mpx** (*int*) – Key point limit per megapixel.
- **tiepoint_limit** (*int*) – Tie point limit.
- **keep_keypoints** (*bool*) – Store keypoints in the project.
- **pairs** (*list[tuple[int, int]]*) – User defined list of camera pairs to match.
- **cameras** (*list[int]*) – List of cameras to match.
- **guided_matching** (*bool*) – Enable guided image matching.
- **reset_matches** (*bool*) – Reset current matches.
- **subdivide_task** (*bool*) – Enable fine-level task subdivision.
- **workitem_size_cameras** (*int*) – Number of cameras in a workitem.
- **workitem_size_pairs** (*int*) – Number of image pairs in a workitem.
- **max_workgroup_size** (*int*) – Maximum workgroup size.
- **laser_scans_vertical_axis** (*int*) – Common laser scans axis.
- **laser_scans_use_initial_orientation** (*bool*) – Use initial laser scan orientation for keypoint matching.
- **match_laser_scans** (*bool*) – Match laser scans using geometric features.
- **progress** (*Callable[[float], None]*) – Progress callback.

mergeComponents (*components*[, *progress*])

Merge components.

Parameters

- **components** (*list[Metashape.Component]*) – List of components to merge.
- **progress** (*Callable[[float], None]*) – Progress callback.

meta

Chunk meta data.

Type*Metashape.MetaData***model**

Default model for the current frame.

Type*Metashape.Model***model_group**

Default model group for the current chunk.

Type*Metashape.ModelGroup***model_groups**

List of model groups in the chunk.

Typelist[*Metashape.ModelGroup*]**models**

List of models for the current frame.

Typelist[*Metashape.Model*]**modified**

Modified flag.

Type

bool

optimizeCameras(*fit_f=True, fit_cx=True, fit_cy=True, fit_b1=False, fit_b2=False, fit_k1=True, fit_k2=True, fit_k3=True, fit_k4=False, fit_p1=True, fit_p2=True, fit_corrections=False, adaptive_fitting=False, tiepoint_covariance=False[, progress]*)

Perform optimization of tie points / camera parameters.

Parameters

- **fit_f** (*bool*) – Enable optimization of focal length coefficient.
- **fit_cx** (*bool*) – Enable optimization of X principal point coordinates.
- **fit_cy** (*bool*) – Enable optimization of Y principal point coordinates.
- **fit_b1** (*bool*) – Enable optimization of aspect ratio.
- **fit_b2** (*bool*) – Enable optimization of skew coefficient.
- **fit_k1** (*bool*) – Enable optimization of k1 radial distortion coefficient.
- **fit_k2** (*bool*) – Enable optimization of k2 radial distortion coefficient.
- **fit_k3** (*bool*) – Enable optimization of k3 radial distortion coefficient.
- **fit_k4** (*bool*) – Enable optimization of k3 radial distortion coefficient.
- **fit_p1** (*bool*) – Enable optimization of p1 tangential distortion coefficient.
- **fit_p2** (*bool*) – Enable optimization of p2 tangential distortion coefficient.
- **fit_corrections** (*bool*) – Enable optimization of additional corrections.
- **adaptive_fitting** (*bool*) – Enable adaptive fitting of distortion coefficients.

- **tiepoint_covariance** (*bool*) – Estimate tie point covariance matrices.
- **progress** (*Callable[[float], None]*) – Progress callback.

orthomosaic

Default orthomosaic for the current frame.

Type

Metashape.Orthomosaic

orthomosaics

List of orthomosaics for the current frame.

Type

list[*Metashape.Orthomosaic*]

pansharpenOrthomosaic(*orthomosaic* [, *channels=0* [, *pan_orthomosaic*], *pan_channels=0*, *clip_to_pan_data=False*, *replace_asset=False* [, *frames*] [, *progress*])

Pansharpen orthomosaic.

Parameters

- **orthomosaic** (*int*) – Orthomosaic to pansharpen.
- **channels** (*int*) – Orthomosaic channel mask (boolean flags, e.g. 0b0010 means only 1st channel is used and the rest ignored).
- **pan_orthomosaic** (*int*) – Detailed orthomosaic.
- **pan_channels** (*int*) – Detailed orthomosaic channel mask (boolean flags, e.g. 0b0010 means only 1st channel is used and the rest ignored).
- **clip_to_pan_data** (*bool*) – Clip result to high resolution orthomosaic.
- **replace_asset** (*bool*) – Replace source orthomosaic with pansharpened result.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

point_cloud

Default point cloud for the current frame.

Type

Metashape.PointCloud

point_cloud_groups

List of point cloud groups in the chunk.

Type

list[*Metashape.PointCloudGroup*]

point_clouds

List of point clouds for the current frame.

Type

list[*Metashape.PointCloud*]

primary_channel

Primary channel index (-1 for default).

Type

int

```
publishData(service=ServiceSketchfab, source_data=TiePointsData,  
            raster_transform=RasterTransformNone, save_point_color=True, save_camera_track=True,  
            title="", description="", tags="", owner="", token="", username="", password="", account="",  
            hostname="", is_draft=False, is_private=False, is_protected=False, tile_size=256,  
            min_zoom_level=-1, max_zoom_level=-1[, projection ], resolution=0, project_id="",  
            upload_images=False[, point_classes ][, image_compression ][, progress ])
```

Publish generated data online.

Parameters

- **service** (`Metashape.ServiceType`) – Service to upload on.
- **source_data** (`Metashape.DataSource`) – Asset type to upload.
- **raster_transform** (`Metashape.RasterTransformType`) – Raster band transformation.
- **save_point_color** (`bool`) – Enables/disables export of point colors.
- **save_camera_track** (`bool`) – Enables/disables export of camera track.
- **title** (`str`) – Dataset title.
- **description** (`str`) – Dataset description.
- **tags** (`str`) – Dataset tags.
- **owner** (`str`) – Account owner (Cesium and Mapbox services).
- **token** (`str`) – Account token (Cesium, Mapbox, Nira (Key Secret), Picterra, Pointbox and Sketchfab services).
- **username** (`str`) – Account username (4DMapper, Agisoft Cloud and Pointscene services).
- **password** (`str`) – Account password (4DMapper, Agisoft Cloud, Pointscene and Sketchfab services).
- **account** (`str`) – Account name (Nira (Key ID) service).
- **hostname** (`str`) – Service hostname (4DMapper and Nira services).
- **is_draft** (`bool`) – Mark dataset as draft (Sketchfab service).
- **is_private** (`bool`) – Set dataset access to private (Pointbox and Sketchfab services).
- **is_protected** (`bool`) – Set dataset access to protected (Pointbox service).
- **tile_size** (`int`) – Tile size in pixels.
- **min_zoom_level** (`int`) – Minimum zoom level.
- **max_zoom_level** (`int`) – Maximum zoom level.
- **projection** (`Metashape.CoordinateSystem`) – Output projection.
- **resolution** (`float`) – Output resolution in meters.
- **project_id** (`str`) – Id of a target project (from Agisoft Cloud project URL).
- **upload_images** (`bool`) – Attach photos to Nira publication.
- **point_classes** (`list[int]`) – List of point classes to be exported.
- **image_compression** (`Metashape.ImageCompression`) – Image compression parameters.
- **progress** (`Callable[[float], None]`) – Progress callback.

raster_transform

Raster transform.

Type

Metashape.RasterTransform

reduceOverlap(*overlap=3, use_selection=False*[, *progress*])

Disable redundant cameras.

Parameters

- **overlap** (*int*) – Target number of cameras observing each point of the surface.
- **use_selection** (*bool*) – Focus on model selection.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

refineMarkers([*markers*][, *progress*])

Refine markers based on images content.

Parameters

- **markers** (*list*[*int*]) – Optional list of markers to be processed.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

refineModel(*downscale=4, iterations=10, smoothness=0.5*[, *model*], *replace_asset=False*[, *cameras*][, *frames*][, *progress*])

Refine polygonal model.

Parameters

- **downscale** (*int*) – Refinement quality (1 - Ultra high, 2 - High, 4 - Medium, 8 - Low, 16 - Lowest).
- **iterations** (*int*) – Number of refinement iterations.
- **smoothness** (*float*) – Smoothing strength. Should be in range [0, 1].
- **model** (*int*) – Model to process.
- **replace_asset** (*bool*) – Replace default asset with refined model.
- **cameras** (*list*[*int*]) – List of cameras to process.
- **frames** (*list*[*int*]) – List of frames to process.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

region

Reconstruction volume selection.

Type

Metashape.Region

remove(*items*)

Remove items from the chunk.

Parameters

items (*list*[*Metashape.Chunk* / *Metashape.Sensor* / *Metashape.Component* / *Metashape.CameraGroup* / *Metashape.MarkerGroup* / *Metashape.ScalebarGroup* / *Metashape.Camera* / *Metashape.Marker* / *Metashape.Scalebar* / *Metashape.CameraTrack* / *Metashape.DepthMaps* / *Metashape.PointCloud* / *Metashape.PointCloudGroup* / *Metashape.Model* / *Metashape.*)

`ModelGroup` / `Metashape.TiledModel` / `Metashape.Elevation` / `Metashape.Orthomosaic` / `Metashape.Trajectory`]) – A list of items to be removed.

removeLighting(*color_mode=False*, *internal_blur=1.5*, *mesh_noise_suppression=1*, *ambient_occlusion_path=""*, *ambient_occlusion_multiplier=1.5*[, *progress*])

Generate model for the chunk frame.

Parameters

- **color_mode** (*bool*) – Enable multi-color processing mode.
- **internal_blur** (*float*) – Internal blur. Should be in range [0, 4].
- **mesh_noise_suppression** (*float*) – Mesh normals noise suppression strength. Should be in range [0, 4].
- **ambient_occlusion_path** (*str*) – Path to ambient occlusion texture atlas. Can be empty.
- **ambient_occlusion_multiplier** (*float*) – Ambient occlusion multiplier. Should be in range [0.25, 4].
- **progress** (*Callable[[float], None]*) – Progress callback.

renderPreview(*width = 2048*, *height = 2048*[, *transform*], *point_size=1*[, *progress*])

Generate preview image for the chunk.

Parameters

- **width** (*int*) – Preview image width.
- **height** (*int*) – Preview image height.
- **transform** (`Metashape.Matrix`) – 4x4 viewpoint transformation matrix.
- **point_size** (*int*) – Point size.
- **progress** (*Callable[[float], None]*) – Progress callback.

Returns

Preview image.

Return type

Metashape.Image

resetRegion()

Reset reconstruction volume selector to default position.

scalebar_accuracy

Expected scale bar accuracy in meters.

Type

float

scalebar_groups

List of scale bar groups in the chunk.

Type

list[*Metashape.ScalebarGroup*]

scalebars

List of scale bars in the chunk.

Type

list[*Metashape.Scalebar*]

selected

Selects/deselects the chunk.

Type

bool

sensors

List of sensors in the chunk.

Type

list[*Metashape.Sensor*]

shapes

Shapes for the current frame.

Type

Metashape.Shapes

smoothModel(*strength=3, apply_to_selection=False, fix_borders=True, preserve_edges=False*[, *model*],
replace_asset=False[, *frames*][, *progress*])

Smooth model using Laplacian smoothing algorithm.

Parameters

- **strength** (*float*) – Smoothing strength.
- **apply_to_selection** (*bool*) – Apply to selected faces.
- **fix_borders** (*bool*) – Fix borders.
- **preserve_edges** (*bool*) – Preserve edges.
- **model** (*int*) – Key of model to smooth.
- **replace_asset** (*bool*) – Replace default asset with smoothed model.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

smoothPointCloud(*smoothing_radius=0*[, *point_cloud*][, *classes*], *apply_to_selection=False*,
clip_to_region=False, replace_asset=False[, *frames*][, *progress*])

Smooth point cloud.

Parameters

- **smoothing_radius** (*float*) – Desired smoothing radius (m).
- **point_cloud** (*int*) – Key of point cloud to filter.
- **classes** (*list[int]*) – List of point classes to be smoothed.
- **apply_to_selection** (*bool*) – Smooth points within selection.
- **clip_to_region** (*bool*) – Clip point cloud to chunk region.
- **replace_asset** (*bool*) – Replace default asset with smoothed point cloud.
- **frames** (*list[int]*) – List of frames to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

sortCameras()

Sorts cameras by their labels.

sortMarkers()

Sorts markers by their labels.

sortScalebars()

Sorts scalebars by their labels.

splitComponents(*items*[, *progress*])

Split components.

Parameters

- **items** (*list*[*Metashape.Camera* / *Metashape.PointCloud*]) – List of items to split.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

thinTiePoints(*point_limit=1000*)

Remove excessive tracks from the tie point cloud.

Parameters

- **point_limit** (*int*) – Maximum number of points for each photo.

thumbnails

Image thumbnails.

Type

Metashape.Thumbnails

tie_points

Generated tie point cloud.

Type

Metashape.TiePoints

tiepoint_accuracy

Expected tie point accuracy in pixels.

Type

float

tiled_model

Default tiled model for the current frame.

Type

Metashape.TiledModel

tiled_models

List of tiled models for the current frame.

Type

list[*Metashape.TiledModel*]

trackMarkers(*first_frame=0*, *last_frame=0*[, *progress*])

Track marker projections through the frame sequence.

Parameters

- **first_frame** (*int*) – Starting frame index.
- **last_frame** (*int*) – Ending frame index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

trajectories

List of trajectories for the current frame.

Type

list[*Metashape.Trajectory*]

trajectory

Default trajectory for the current frame.

Type

Metashape.Trajectory

transform

4x4 matrix specifying chunk location in the world coordinate system.

Type

Metashape.ChunkTransform

transformRaster(*source_data*=*ElevationData*[, *asset*], *subtract*=*False*[, *operand_chunk*][, *operand_frame*][, *operand_asset*], *width*=0, *height*=0[, *world_transform*], *resolution*=0, *resolution_x*=0, *resolution_y*=0, *nodata_value*=-32767, *north_up*=*True*[, *region*][, *projection*], *clip_to_boundary*=*True*, *copy_orthophotos*=*True*, *replace_asset*=*False*[, *frames*][, *progress*])

Transform DEM or orthomosaic.

Parameters

- **source_data** (*Metashape.DataSource*) – Selects between DEM and orthomosaic.
- **asset** (*int*) – Asset key to transform.
- **subtract** (*bool*) – Subtraction flag.
- **operand_chunk** (*int*) – Operand chunk key.
- **operand_frame** (*int*) – Operand frame key.
- **operand_asset** (*int*) – Operand asset key.
- **width** (*int*) – Raster width.
- **height** (*int*) – Raster height.
- **world_transform** (*Metashape.Matrix*) – 2x3 raster-to-world transformation matrix.
- **resolution** (*float*) – Output resolution in meters.
- **resolution_x** (*float*) – Pixel size in the X dimension in projected units.
- **resolution_y** (*float*) – Pixel size in the Y dimension in projected units.
- **nodata_value** (*float*) – No-data value (DEM export only).
- **north_up** (*bool*) – Use north-up orientation for export.
- **region** (*Metashape.BBox*) – Region to be processed.
- **projection** (*Metashape.OrthoProjection*) – Output projection.
- **clip_to_boundary** (*bool*) – Clip raster to boundary shapes.
- **copy_orthophotos** (*bool*) – Copy orthophotos (orthomosaic asset type only).
- **replace_asset** (*bool*) – Replace default raster with transformed one.
- **frames** (*list[int]*) – List of frames to process.

- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

triangulateTiePoints(*max_error=10, min_image=2*[, *progress*])

Rebuild tie point cloud for the chunk.

Parameters

- **max_error** (*float*) – Reprojection error threshold.
- **min_image** (*int*) – Minimum number of point projections.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

updateTransform()

Update chunk transformation based on reference data.

world_crs

Coordinate system used as world coordinate system.

Type

Metashape.CoordinateSystem

class Metashape.ChunkTransform

Transformation between chunk and world coordinates systems.

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.ChunkTransform

matrix

Transformation matrix.

Type

Metashape.Matrix

rotation

Rotation component.

Type

Metashape.Matrix

scale

Scale component.

Type

float

translation

Translation component.

Type

Metashape.Vector

class Metashape.CirTransform

CIR calibration matrix.

calibrate()

Calibrate CIR matrix based on orthomosaic histogram.

coeffs

Color matrix.

Type

Metashape.Matrix

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.CirTransform

reset()

Reset CIR calibration matrix.

class Metashape.ClassificationMethod

Index values classification method in [EqualIntervalsClassification, JenksNaturalBreaksClassification]

class Metashape.CloudClient

CloudClient class provides access to the Agisoft Cloud processing service and allows to create and manage cloud projects.

The following example connects to the service and lists available projects:

```
>>> import Metashape
>>> client = Metashape.CloudClient()
>>> client.username = 'user'
>>> client.password = 'password'
>>> client.projectList()
```

abortProcessing(*document*)

Cancel processing.

Parameters

document (*Metashape.Document*) – Project to cancel.

client_id

Client software id (optional).

Type

str

client_secret

Client software secret (optional).

Type

str

downloadProject(*document* [, *progress*])

Download project from the cloud.

Parameters

- **document** (*Metashape.Document*) – Project to download.

- **progress** (*Callable*[[float], None]) – Progress callback.

getProcessingStatus(*document*)

Get processing status.

Parameters

document (*Metashape.Document*) – Project being processed.

Returns

Processing status.

Return type

dict

getProjectList()

Get list of projects in the cloud.

Returns

List of projects.

Return type

list

password

Cloud account password.

Type

str

processProject(*document, tasks*)

Start processing in the cloud.

Parameters

- **document** (*Metashape.Document*) – Project to process.
- **tasks** (*list* [*Metashape.NetworkTask*]) – List of processing tasks to execute.

uploadProject(*document, publish=False* [, *progress*])

Upload project to the cloud.

Parameters

- **document** (*Metashape.Document*) – Project to upload.
- **publish** (*bool*) – Publish project for online visualization.
- **progress** (*Callable*[[float], None]) – Progress callback.

username

Cloud account username.

Type

str

class Metashape.Component

Component instance

chunk

Chunk the component belongs to.

Type

Metashape.Chunk

key

Component identifier.

Type
int

label

Component label.

Type
str

partition

Component partition.

Type
list

region

Reconstruction volume selection.

Type
Metashape.Region

transform

4x4 matrix specifying chunk location in the world coordinate system.

Type
Metashape.ChunkTransform

class Metashape.CoordinateSystem

Coordinate reference system (local, geographic or projected).

The following example changes chunk coordinate system to WGS 84 / UTM zone 41N and loads reference data from file:

```
>>> import Metashape
>>> chunk = Metashape.app.document.chunk
>>> chunk.crs = Metashape.CoordinateSystem("EPSG::32641")
>>> chunk.importReference("gcp.txt", Metashape.ReferenceFormatCSV)
>>> chunk.updateTransform()
```

addGeoid(path)

Register geoid model.

Parameters
path (*str*) – Path to geoid file.

authority

Authority identifier of the coordinate system.

Type
str

copy()

Return a copy of the object.

Returns
A copy of the object.

Return type

Metashape.CoordinateSystem

datumTransform(*source, target*)

Coordinate transformation from source to target coordinate system datum.

Parameters

- **source** (*Metashape.CoordinateSystem*) – Source coordinate system.
- **target** (*Metashape.CoordinateSystem*) – Target coordinate system.

Returns

4x4 transformation matrix.

Return type

Metashape.Matrix

geoccs

Base geocentric coordinate system.

Type

Metashape.CoordinateSystem

geogcs

Base geographic coordinate system.

Type

Metashape.CoordinateSystem

geoid_height

Fixed geoid height to be used instead of interpolated values.

Type

float

init(*crs*)

Initialize projection based on specified WKT definition or authority identifier.

Parameters

crs (*str*) – WKT definition of coordinate system or authority identifier.

listBuiltinCRS()

Returns a list of builtin coordinate systems.

listGeoids()

Returns a list of loaded geoids.

localframe(*point*)

Returns 4x4 transformation matrix to LSE coordinates at the given point.

Parameters

point (*Metashape.Vector*) – Coordinates of the origin in the geocentric coordinates.

Returns

Transformation from geocentric coordinates to local coordinates.

Return type

Metashape.Matrix

name

Name of the coordinate system.

Type

str

proj4

Coordinate system definition in PROJ.4 format.

Type

str

project(*point*)

Projects point from geocentric coordinates to projected geographic coordinate system.

Parameters

point ([Metashape.Vector](#)) – 3D point in geocentric coordinates.

Returns

3D point in projected coordinates.

Return type

Metashape.Vector

setContext(*document*)

Set geoid lookup context.

Parameters

document ([Metashape.Document](#)) – Document to use for geoid lookup.

towgs84

TOWGS84 transformation parameters (dx, dy, dz, rx, ry, rz, scale).

Type

list[float]

transform(*point, source, target*)

Transform point coordinates between coordinate systems.

Parameters

- **point** ([Metashape.Vector](#)) – 2D or 3D point coordinates.
- **source** ([Metashape.CoordinateSystem](#)) – Source coordinate system.
- **target** ([Metashape.CoordinateSystem](#)) – Target coordinate system.

Returns

Transformed point coordinates.

Return type

Metashape.Vector

transformationMatrix(*point, source, target*)

Local approximation of coordinate transformation from source to target coordinate system at the given point.

Parameters

- **point** ([Metashape.Vector](#)) – 3D point coordinates.
- **source** ([Metashape.CoordinateSystem](#)) – Source coordinate system.
- **target** ([Metashape.CoordinateSystem](#)) – Target coordinate system.

Returns

4x4 transformation matrix.

Return type

Metashape.Matrix

unproject(*point*)

Unprojects point from projected coordinates to geocentric coordinates.

Parameters

point (*Metashape.Vector*) – 3D point in projected coordinate system.

Returns

3D point in geocentric coordinates.

Return type

Metashape.Vector

wkt

Coordinate system definition in WKT format.

Type

str

wkt2

Coordinate system definition in WKT format, version 2.

Type

str

class Metashape.DataSource

Data source in [TiePointsData, PointCloudData, ModelData, TiledModelData, ElevationData, OrthomosaicData, DepthMapsData, ImagesData, TrajectoryData, LaserScansData, DepthMapsAndLaserScansData, MasksData, BlockModelData]

class Metashape.DataType

Data type in [DataTypeUndefined, DataType8i, DataType8u, DataType16i, DataType16u, DataType16f, DataType32i, DataType32u, DataType32f, DataType64i, DataType64u, DataType64f]

class Metashape.DepthMap

Depth map data.

calibration

Depth map calibration.

Type

Metashape.Calibration

copy()

Returns a copy of the depth map.

Returns

Copy of the depth map.

Return type

Metashape.DepthMap

getCalibration(*level=0*)

Returns calibration data.

Parameters

level (*int*) – Level index.

Returns

Calibration data.

Return type

Metashape.Calibration

image([*level*])

Returns image data.

Parameters

level (*int*) – Level index.

Returns

Image data.

Return type

Metashape.Image

setCalibration(*calibration*, *level=0*)

Parameters

- **calibration** (*Metashape.Calibration*) – Calibration data.
- **level** (*int*) – Level index.

setImage(*image*, *level=0*)

Parameters

- **image** (*Metashape.Image*) – Image object with depth map data.
- **level** (*int*) – Level index.

class Metashape.DepthMaps

A set of depth maps generated for a chunk frame.

clear()

Clears depth maps data.

copy()

Create a copy of the depth maps.

Returns

Copy of the depth maps.

Return type

Metashape.DepthMaps

items()

List of items.

key

Depth maps identifier.

Type

int

keys()

List of item keys.

label

Depth maps label.

Type

str

meta

Depth maps meta data.

Type

Metashape.MetaData

modified

Modified flag.

Type

bool

values()

List of item values.

class Metashape.Document

Metashape project.

Contains list of chunks available in the project. Implements processing operations that work with multiple chunks. Supports saving/loading project files.

The project currently opened in Metashape window can be accessed using `Metashape.app.document` attribute. Additional Document objects can be created as needed.

The following example saves active chunk from the opened project in a separate project:

```
>>> import Metashape
>>> doc = Metashape.app.document
>>> doc.save(path = "project.psz", chunks = [doc.chunk])
```

addChunk()

Add new chunk to the document.

Returns

Created chunk.

Return type

Metashape.Chunk

addGeoid(path)

Add geoid to the document.

Parameters

path (str) – Path to the geoid file.

alignChunks([chunks][, reference], method=0, fit_scale=True, downscale=1, generic_preselection=False, filter_mask=False, mask_tiepoints=False, keypoint_limit=40000[, markers][, progress])

Align specified set of chunks.

Parameters

- **chunks** (list[int]) – List of chunks to be aligned.
- **reference** (int) – Chunk to be used as a reference.
- **method** (int) – Alignment method (0 - point based, 1 - marker based, 2 - camera based).

- **fit_scale** (*bool*) – Fit chunk scale during alignment.
- **downscale** (*int*) – Alignment accuracy (0 - Highest, 1 - High, 2 - Medium, 4 - Low, 8 - Lowest).
- **generic_preselection** (*bool*) – Enables image pair preselection.
- **filter_mask** (*bool*) – Filter points by mask.
- **mask_tiepoints** (*bool*) – Apply mask filter to tie points.
- **keypoint_limit** (*int*) – Maximum number of points for each photo.
- **markers** (*list[int]*) – List of markers to be used for marker based alignment.
- **progress** (*Callable[[float], None]*) – Progress callback.

append(*document* [, *chunks*] [, *progress*])

Append the specified Document object to the current document.

Parameters

- **document** (*Metashape.Document*) – Document object to be appended.
- **chunks** (*list[Metashape.Chunk]*) – List of chunks to append.
- **progress** (*Callable[[float], None]*) – Progress callback.

chunk

Active chunk.

Type

Metashape.Chunk

chunks

List of chunks in the document.

Type

list[Metashape.Chunk]

clear()

Clear the contents of the Document object.

copy()

Return a copy of the document.

Returns

A copy of the document.

Return type

Metashape.Document

findChunk(*key*)

Find chunk by its key.

Returns

Found chunk.

Return type

Metashape.Chunk

geoids

List of geoids in the document.

Typelist[*Metashape.Geoid*]

mergeChunks(*copy_laser_scans=True, copy_masks=True, copy_depth_maps=False, copy_point_clouds=False, copy_models=False, copy_tiled_models=False, copy_elevations=False, copy_orthomosaics=False, merge_markers=False, merge_tiepoints=False, merge_assets=False*, [*chunks*], [*progress*])

Merge specified set of chunks.

Parameters

- **copy_laser_scans** (*bool*) – Copy laser scans.
- **copy_masks** (*bool*) – Copy masks.
- **copy_depth_maps** (*bool*) – Copy depth maps.
- **copy_point_clouds** (*bool*) – Copy point clouds.
- **copy_models** (*bool*) – Copy models.
- **copy_tiled_models** (*bool*) – Copy tiled models.
- **copy_elevations** (*bool*) – Copy DEMs.
- **copy_orthomosaics** (*bool*) – Copy orthomosaics.
- **merge_markers** (*bool*) – Merge markers.
- **merge_tiepoints** (*bool*) – Merge tie points.
- **merge_assets** (*bool*) – Merge default assets.
- **chunks** (*list[int]*) – List of chunks to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

meta

Document meta data.

Type*Metashape.MetaData***modified**

Modified flag.

Type

bool

open(*path, read_only=False, ignore_lock=False, archive=True*)

Load document from the specified file.

Parameters

- **path** (*str*) – Path to the file.
- **read_only** (*bool*) – Open document in read-only mode.
- **ignore_lock** (*bool*) – Ignore lock state for project modifications.
- **archive** (*bool*) – Override project format when using non-standard file extension.

path

Path to the document file.

Type
str

read_only

Read only status.

Type
bool

remove(items)

Remove a set of items from the document.

Parameters

items (*list* [`Metashape.Chunk` / `Metashape.Geoid`]) – A list of items to be removed.

save([path][[, chunks][[, version]], archive=True)

Save document to the specified file.

Parameters

- **path** (*str*) – Optional path to the file.
- **chunks** (*list* [`Metashape.Chunk`]) – List of chunks to be saved.
- **version** (*str*) – Project version to save.
- **archive** (*bool*) – Override project format when using non-standard file extension.

sortChunks()

Sorts chunks by their labels.

class Metashape.Elevation

Digital elevation model.

class Patch

Elevation patch.

class InterpolationType

DEM fill patch interpolation method in [Constant, Plane, IDW, NaturalNeighbour]

class Type

DEM patch type in [Fill, Breakline]

copy()

Returns a copy of the patch.

Returns

Copy of the patch.

Return type

Metashape.Elevation.Patch

exclude_nested_polygons

Exclude nested polygons.

Type
bool

fill_elevation

Elevation value for Constant interpolation method.

Type
float

idw_power

Power parameter for IDW interpolation method.

Type
int

interpolation_type

Interpolation method.

Type
Metashape.Elevation.Patch.InterpolationType

sample_edges

Sample values from polygon edges (ignored for Constant interpolation method).

Type
bool

type

Patch type.

Type
Metashape.Elevation.Patch.PatchType

class Patches

A set of elevation patches.

items()

List of items.

keys()

List of item keys.

remove(items)

Remove patches from the elevation.

Parameters

items (*list*[*Metashape.Shape*] / *Metashape.Shape*) – A list of items to be removed.

values()

List of item values.

altitude(point)

Return elevation value at the specified point.

Parameters

point (*Metashape.Vector*) – Point coordinates in the DEM coordinate system.

Returns

Elevation value.

Return type

float

altitudeSlopeAspect(point)

Return elevation, slope and aspect values at the specified point.

Parameters

point (*Metashape.Vector*) – Point coordinates in the DEM coordinate system.

Returns

Elevation, slope and aspect values.

Return type

tuple[float, float, float]

bottom

Y coordinate of the bottom side.

Type

float

clear()

Clears digital elevation model data.

copy()

Create a copy of the digital elevation model.

Returns

Copy of the digital elevation model.

Return type*Metashape.Elevation***coverageArea()**Calculate coverage area of the DEM in m². Only pixels with data are used.**Returns**

Area covered by the DEM.

Return type

float

crs

Coordinate system of elevation model.

Type*Metashape.CoordinateSystem***height**

Elevation model height.

Type

int

key

Elevation model identifier.

Type

int

label

Elevation model label.

Type

str

left

X coordinate of the left side.

Type

float

max

Maximum elevation value.

Type
float

meta

Elevation model meta data.

Type
Metashape.MetaData

min

Minimum elevation value.

Type
float

modified

Modified flag.

Type
bool

palette

Color palette.

Type
dict

palette_absolute_values

Use palette keys as absolute elevation values.

Type
bool

patches

Elevation patches.

Type
Metashape.Elevation.Patches

pickPoint(*origin, target*)

Returns ray intersection with the DEM (point on the ray nearest to some point).

Parameters

- **origin** (*Metashape.Vector*) – Ray origin in the DEM coordinate system.
- **target** (*Metashape.Vector*) – Point on the ray in the DEM coordinate system.

Returns

Coordinates of the intersection point in the DEM coordinate system.

Return type

Metashape.Vector

projection

Projection of elevation model.

Type
Metashape.OrthoProjection

resolution

DEM resolution in meters.

Type
float

right

X coordinate of the right side.

Type
float

top

Y coordinate of the top side.

Type
float

update(*progress*)

Apply edits to elevation.

Parameters

progress (*Callable*[[float], None]) – Progress callback.

width

Elevation model width.

Type
int

class Metashape.EulerAngles

Euler angles in [EulerAnglesUndefined, EulerAnglesYPR, EulerAnglesOPK, EulerAnglesPOK, EulerAnglesANK]

class Metashape.FaceCount

Face count in [LowFaceCount, MediumFaceCount, HighFaceCount, CustomFaceCount]

class Metashape.FilterMode

Depth filtering mode in [NoFiltering, MildFiltering, ModerateFiltering, AggressiveFiltering]

class Metashape.FrameStep

Frame step size for video import in [CustomFrameStep, SmallFrameStep, MediumFrameStep, LargeFrameStep]

class Metashape.Geoid

Geoid attributes

authority

Geoid authority.

Type
str

height

Geoid height.

Type
int

horz_crs

Horizontal coordinate system.

Type

Metashape.CoordinateSystem

name

Geoid name.

Type

str

path

Path to geoid file.

Type

str

vert_crs

Vertical coordinate system.

Type

Metashape.CoordinateSystem

width

Geoid width.

Type

int

class Metashape.Geometry

Geometry data.

GeometryCollection(*geometries*)

Create a GeometryCollection geometry.

Parameters

geometries (*list*[*Metashape.Geometry*]) – Child geometries.

Returns

A GeometryCollection geometry.

Return type

Metashape.Geometry

LineString(*coordinates*)

Create a LineString geometry.

Parameters

coordinates (*list*[*Metashape.Vector*]) – List of vertex coordinates.

Returns

A LineString geometry.

Return type

Metashape.Geometry

MultiLineString(*geometries*)

Create a MultiLineString geometry.

Parameters

geometries (*list*[*Metashape.Geometry*]) – Child line strings.

Returns

A point geometry.

Return type

Metashape.Geometry

MultiPoint(*geometries*)

Create a MultiPoint geometry.

Parameters

geometries (*list*[*Metashape.Geometry*]) – Child points.

Returns

A point geometry.

Return type

Metashape.Geometry

MultiPolygon(*geometries*)

Create a MultiPolygon geometry.

Parameters

geometries (*list*[*Metashape.Geometry*]) – Child polygons.

Returns

A point geometry.

Return type

Metashape.Geometry

Point(*vector*)

Create a Point geometry.

Parameters

vector (*Metashape.Vector* | *list*[*float*]) – Point coordinates.

Returns

A point geometry.

Return type

Metashape.Geometry

Polygon(*exterior_ring*[, *interior_rings*])

Create a Polygon geometry.

Parameters

- **exterior_ring** (*list*[*Metashape.Vector*]) – Point coordinates.
- **interior_rings** (*list*[*Metashape.Vector*]) – Point coordinates.

Returns

A Polygon geometry.

Return type

Metashape.Geometry

class Type

Geometry type in [PointType, LineStringType, PolygonType, MultiPointType, MultiLineStringType, MultiPolygonType, GeometryCollectionType]

coordinates

List of vertex coordinates.

Type

list[*Metashape.Vector*]

geometries

List of child geometries.

Type

list[*Metashape.Geometry*]

is_3d

Is 3D flag.

Type

bool

type

Geometry type.

Type

Metashape.Geometry.Type

class *Metashape.Image*(*width*, *height*, *channels*, *datatype*='U8')

n-channel image

Parameters

- **width** (*int*) – image width
- **height** (*int*) – image height
- **channels** (*str*) – color channel layout, e.g. 'RGB', 'RGBA', etc.
- **datatype** (*str*) – pixel data type in ['U8', 'U16', 'U32', 'F16', 'F32', 'F64']

channels

Channel mapping for the image.

Type

str

cn

Number of color channels.

Type

int

convert(*channels*[, *datatype*])

Convert image to specified data type and channel layout.

Parameters

- **channels** (*str*) – color channels to be loaded, e.g. 'RGB', 'RGBA', etc.
- **datatype** (*str*) – pixel data type in ['U8', 'U16', 'U32', 'F16', 'F32', 'F64']

Returns

Converted image.

Return type

Metashape.Image

copy()

Return a copy of the image.

Returns

copy of the image

Return type

Metashape.Image

data_type

Data type used to store pixel values.

Type

str

fromstring(*data*, *width*, *height*, *channels*, *datatype='U8'*)

Create image from byte array.

Parameters

- **data** (*str*) – raw image data
- **width** (*int*) – image width
- **height** (*int*) – image height
- **channels** (*str*) – color channel layout, e.g. 'RGB', 'RGBA', etc.
- **datatype** (*str*) – pixel data type in ['U8', 'U16', 'U32', 'F16', 'F32', 'F64']

Returns

Created image.

Return type

Metashape.Image

gaussianBlur(*radius*)

Smooth image with a gaussian filter.

Parameters

radius (*float*) – smoothing radius.

Returns

Smoothed image.

Return type

Metashape.Image

height

Image height.

Type

int

open(*path*, *layer=0*, *datatype='U8'* [, *channels*] [, *x*] [, *y*] [, *w*] [, *h*])

Load image from file.

Parameters

- **path** (*str*) – path to the image file
- **layer** (*int*) – image layer in case of multipage file
- **datatype** (*str*) – pixel data type in ['U8', 'U16', 'U32', 'F16', 'F32', 'F64']

- **channels** (*str*) – color channels to be loaded, e.g. ‘RGB’, ‘RGBA’, etc.
- **x** (*int*) – x offset of image region.
- **y** (*int*) – y offset of image region.
- **w** (*int*) – width of image region.
- **h** (*int*) – height of image region.

Returns

Loaded image.

Return type

Metashape.Image

resize(*width, height*)

Resize image to specified dimensions.

Parameters

- **width** (*int*) – new image width
- **height** (*int*) – new image height

Returns

resized image

Return type

Metashape.Image

save(*path*[, *compression*])

Save image to the file.

Parameters

- **path** (*str*) – path to the image file
- **compression** (*Metashape.ImageCompression*) – compression options

tostring()

Convert image to byte array.

Returns

Raw image data.

Return type

str

undistort(*calib, center_principal_point=True, square_pixels=True*)

Undistort image using provided calibration.

Parameters

- **calib** (*Metashape.Calibration*) – lens calibration
- **center_principal_point** (*bool*) – moves principal point to the image center
- **square_pixels** (*bool*) – create image with square pixels

Returns

undistorted image

Return type

Metashape.Image

uniformNoise(*amplitude*)

Add uniform noise with specified amplitude.

Parameters

amplitude (*float*) – noise amplitude.

Returns

Image with added noise.

Return type

Metashape.Image

warp(*calib0*, *trans0*, *calib1*, *trans1*)

Warp image by rotating virtual viewpoint.

Parameters

- **calib0** (*Metashape.Calibration*) – initial calibration
- **trans0** (*Metashape.Matrix*) – initial camera orientation as 4x4 matrix
- **calib1** (*Metashape.Calibration*) – final calibration
- **trans1** (*Metashape.Matrix*) – final camera orientation as 4x4 matrix

Returns

warped image

Return type

Metashape.Image

width

Image width.

Type

int

class Metashape.ImageCompression

Image compression parameters.

The following example demonstrates how to export orthomosaic with custom compression parameters:

```
>>> import Metashape
>>> doc = Metashape.app.document
>>> chunk = doc.chunk
>>> compression = Metashape.ImageCompression()
>>> compression.tiff_tiled = True
>>> compression.tiff_overviews = True
>>> compression.tiff_compression = Metashape.ImageCompression.TiffCompressionJPEG
>>> compression.jpeg_quality = 95
>>> chunk.exportRaster('ortho.tif', source_data=Metashape.OrthomosaicData, image_
↪ compression=compression)
```

class TiffCompression

Tiff compression in [TiffCompressionNone, TiffCompressionLZW, TiffCompressionJPEG, TiffCompressionPackbits, TiffCompressionDeflate]

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.Viewpoint

jpeg_quality

JPEG quality.

Type

int

tiff_big

Enable BigTIFF compression for TIFF files.

Type

bool

tiff_compression

Tiff compression.

Type

int

tiff_overviews

Enable image pyramid deneneration for TIFF files.

Type

bool

tiff_tiled

Export tiled TIFF.

Type

bool

class Metashape.ImageFormat

Image format in [ImageFormatNone, ImageFormatJPEG, ImageFormatTIFF, ImageFormatPNG, ImageFormatBMP, ImageFormatEXR, ImageFormatPNM, ImageFormatSGI, ImageFormatCR2, ImageFormatBZ2, ImageFormatSEQ, ImageFormatBIL, ImageFormatASCII, ImageFormatXYZ, ImageFormatARA, ImageFormatTGA, ImageFormatDDS, ImageFormatJP2, ImageFormatWebP, ImageFormatJXL, ImageFormatKTX]

class Metashape.ImageLayout

Image layout in [UndefinedLayout, FlatLayout, MultiframeLayout, MultiplaneLayout]

class Metashape.Interpolation

Interpolation mode in [DisabledInterpolation, EnabledInterpolation, Extrapolated]

class Metashape.License

License information.

activate(*license_key*)

Activate software online using a license key.

Parameters

key (*str*) – Activation key.

activateOffline(*activation_params*)

Create a request for offline activation.

Parameters

activation_params (*str*) – The content of .actparam file.

Returns

The activation request which should be saved to .actreq file.

Return type

str

borrowLicense(*seconds*)

Borrow floating license for the specified number of seconds.

Parameters

seconds (*int*) – Borrow duration in seconds.

borrowed

License borrowed flag.

Type

bool

deactivate()

Deactivate software online.

deactivateOffline()

Create a request for offline deactivation.

Returns

The deactivation request which should be saved to .actreq file.

Return type

str

expiration

License expiration as a Unix timestamp in seconds.

Type

int

floating

License floating flag.

Type

bool

install(*activation_response*)

Install license from the activation response.

Parameters

activation_response (*str*) – The content of .actresp file.

rehostable

License rehostable flag.

Type

bool

returnLicense()

Return borrowed license to the license server.

valid

Metashape activation status.

Type

bool

class Metashape.MappingMode

UV mapping mode in [GenericMapping, OrthophotoMapping, AdaptiveOrthophotoMapping, SphericalMapping, CameraMapping]

class Metashape.Marker

Marker instance

class Projection

Marker data().

coord

Point coordinates in pixels.

Type

Metashape.Vector

pinned

Pinned flag.

Type

bool

valid

Valid flag.

Type

bool

class Projections

Collection of projections specified for the marker

items()

List of items.

keys()

List of item keys.

values()

List of item values.

class Reference

Marker reference data.

accuracy

Marker location accuracy.

Type

Metashape.Vector

enabled

Enabled flag.

Type

bool

location

Marker coordinates.

Type

Metashape.Vector

class Type

Marker type in [Regular, Vertex, Fiducial]

chunk

Chunk the marker belongs to.

Type

Metashape.Chunk

enabled

Enables/disables the marker.

Type

bool

frames

Marker frames.

Type

list[*Metashape.Marker*]

group

Marker group.

Type

Metashape.MarkerGroup

key

Marker identifier.

Type

int

label

Marker label.

Type

str

meta

Marker meta data.

Type

Metashape.MetaData

position

Marker position in the current frame.

Type

Metashape.Vector

position_covariance

Marker position covariance.

Type

Metashape.Matrix

projections

List of marker projections.

Type

Metashape.Marker.Projections

reference

Marker reference data.

Type

Metashape.Marker.Reference

selected

Selects/deselects the marker.

Type

bool

sensor

Fiducial mark sensor.

Type

Metashape.Sensor

type

Marker type.

Type

Metashape.Marker.Type

class Metashape.MarkerGroup

MarkerGroup objects define groups of multiple markers. The grouping is established by assignment of a MarkerGroup instance to the Marker.group attribute of participating markers.

key

Marker group identifier.

Type

int

label

Marker group label.

Type

str

selected

Current selection state.

Type

bool

class Metashape.Mask

Mask instance

copy()

Returns a copy of the mask.

Returns

Copy of the mask.

Return type*Metashape.Mask***image()**

Returns image data.

Returns

Image data.

Return type*Metashape.Image***invert()**

Create inverted copy of the mask.

Returns

Inverted copy of the mask.

Return type*Metashape.Mask***load(*path*[, *layer*])**

Loads mask from file.

Parameters

- **path** (*str*) – Path to the image file to be loaded.
- **layer** (*int*) – Optional layer index in case of multipage files.

setImage(*image*)**Parameters****image** (*Metashape.Image*) – Image object with mask data.**class Metashape.MaskOperation**

Mask operation in [MaskOperationReplacement, MaskOperationUnion, MaskOperationIntersection, MaskOperationDifference]

class Metashape.MaskingMode

Masking mode in [MaskingModeAlpha, MaskingModeFile, MaskingModeBackground, MaskingModeModel, MaskingModeAI]

class Metashape.Masks

A set of masks for a chunk frame.

clear()

Clears masks data.

copy()

Create a copy of the masks.

Returns

Copy of the masks.

Return type*Metashape.Masks***items()**

List of items.

key

Masks identifier.

Type
int

keys()

List of item keys.

label

Masks label.

Type
str

meta

Masks meta data.

Type
Metashape.MetaData

modified

Modified flag.

Type
bool

values()

List of item values.

class Metashape.Matrix

m-by-n matrix

```
>>> import Metashape
>>> m1 = Metashape.Matrix.Diag( (1,2,3,4) )
>>> m3 = Metashape.Matrix( [[1,2,3,4], [1,2,3,4], [1,2,3,4], [1,2,3,4]] )
>>> m2 = m1.inv()
>>> m3 = m1 * m2
>>> x = m3.det()
>>> if x == 1:
...     Metashape.app.messageBox("Diagonal matrix dimensions: " + str(m3.size))
```

Diag(*vector*)

Create a diagonal matrix.

Parameters

vector (*Metashape.Vector* | *list[float]*) – The vector of diagonal entries.

Returns

A diagonal matrix.

Return type

Metashape.Matrix

Rotation(*matrix*)

Create a rotation matrix.

Parameters

matrix (*Metashape.Matrix*) – The 3x3 rotation matrix.

Returns

4x4 matrix representing rotation.

Return type

Metashape.Matrix

Scale(*scale*)

Create a scale matrix.

Parameters

scale (*Metashape.Vector*) – The scale vector.

Returns

A matrix representing scale.

Return type

Metashape.Matrix

Translation(*vector*)

Create a translation matrix.

Parameters

vector (*Metashape.Vector*) – The translation vector.

Returns

A matrix representing translation.

Return type

Metashape.Matrix

col(*index*)

Returns column of the matrix.

Returns

matrix column.

Return type

Metashape.Vector

copy()

Returns a copy of this matrix.

Returns

an instance of itself

Return type

Metashape.Matrix

det()

Return the determinant of a matrix.

Returns

Return a the determinant of a matrix.

Return type

float

inv()

Returns an inverted copy of the matrix.

Returns

inverted matrix.

Return type

Metashape.Matrix

mulp(*point*)

Transforms a point in homogeneous coordinates.

Parameters

point (*Metashape.Vector*) – The point to be transformed.

Returns

transformed point.

Return type

Metashape.Vector

mulv(*vector*)

Transforms vector in homogeneous coordinates.

Parameters

vector (*Metashape.Vector*) – The vector to be transformed.

Returns

transformed vector.

Return type

Metashape.Vector

rotation()

Returns rotation component of the 4x4 matrix.

Returns

rotation component

Return type

Metashape.Matrix

row(*index*)

Returns row of the matrix.

Returns

matrix row.

Return type

Metashape.Vector

scale()

Returns scale component of the 4x4 matrix.

Returns

scale component

Return type

float

size

Matrix dimensions.

Type

tuple

svd()

Returns singular value decomposition of the matrix.

Returns

u, s, v tuple where $a = u * \text{diag}(s) * v$

Return type

tuple[*Metashape.Matrix*, *Metashape.Vector*, *Metashape.Matrix*]

t()

Return a new, transposed matrix.

Returns

a transposed matrix

Return type

Metashape.Matrix

translation()

Returns translation component of the 4x4 matrix.

Returns

translation component

Return type

Metashape.Vector

zero()

Set all matrix elements to zero.

class Metashape.MetaData(*object*)

Collection of object properties

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.MetaData

items()

List of items.

keys()

List of item keys.

values()

List of item values.

class Metashape.Model

Triangular mesh model instance

class Criterion

Model filter criterion in [ComponentSize, PolygonSize, VertexConfidence]

class Face

Triangular face of the model

hidden

Face visibility flag.

Type

bool

selected

Face selection flag.

Type

bool

tex_index

Texture page index.

Type

int

tex_vertices

Texture vertex indices.

Type

tuple[int, int, int]

vertices

Vertex indices.

Type

tuple[int, int, int]

class Faces

Collection of model faces

resize(*count*)

Resize faces list.

Parameters

count (*int*) – new face count

class Statistics

Model statistics

components

Number of connected components.

Type

int

degenerate_faces

Number of degenerate faces.

Type

int

duplicate_faces

Number of duplicate faces.

Type

int

faces

Total number of faces.

Type

int

flipped_normals

Number of edges with flipped normals.

Type
int

free_vertices

Number of free vertices.

Type
int

invalid_vertices

Number of vertices with NaN coordinates.

Type
int

multiple_edges

Number of edges connecting more than 2 faces.

Type
int

open_edges

Number of open edges.

Type
int

out_of_range_indices

Number of out of range indices.

Type
int

similar_vertices

Number of similar vertices.

Type
int

vertices

Total number of vertices.

Type
int

zero_faces

Number of zero faces.

Type
int

class TexVertex

Texture vertex of the model

coord

2D vertex coordinates.

Type
Metashape.Vector

class TexVertices

Collection of model texture vertices

resize(*count*)

Resize vertex list.

Parameters

count (*int*) – new vertex count

class Texture

Model texture.

bands

List of color bands.

Type

list[str]

data_type

Data type used to store color values.

Type

Metashape.DataType

image(*page=0*)

Return texture image.

Parameters

page (*int*) – Texture index for multitextured models.

Returns

Texture image.

Return type

Metashape.Image

label

Animation label.

Type

str

meta

Camera track meta data.

Type

Metashape.MetaData

model

Model the texture belongs to.

Type

Metashape.Model

setImage(*image, page=0*)

Initialize texture from image data.

Parameters

- **image** (*Metashape.Image*) – Texture image.
- **page** (*int*) – Texture index for multitextured models.

type

Texture type.

Type

Metashape.Model.TextureType

class TextureType

Texture type in [DiffuseMap, NormalMap, OcclusionMap, DisplacementMap]

class Vertex

Vertex of the model

color

Vertex color.

Type

tuple of numbers

confidence

Vertex confidence.

Type

float

coord

Vertex coordinates.

Type

Metashape.Vector

class Vertices

Collection of model vertices

resize(count)

Resize vertex list.

Parameters

count (*int*) – new vertex count

addTexture(type=Model.DiffuseMap)

Add new texture to the model.

Parameters

type (*Metashape.Model.TextureType*) – Texture type.

Returns

Created texture.

Return type

Metashape.Model.Texture

area()

Return area of the model surface.

Returns

Model area.

Return type

float

bands

List of color bands.

Type

list[str]

block_index

Model block index.

Type

tuple

block_region

Model block region.

Type

Metashape.Region

cleanModel(*criterion*, *level*[, *progress*])

Remove model faces based on specified criterion.

Parameters

- **criterion** (*Metashape.Model.Criterion*) – Model filtering criterion.
- **level** (*int*) – Filtering threshold in percents.
- **progress** (*Callable[[float], None]*) – Progress callback.

clear()

Clears model data.

closeHoles(*level=30*, *apply_to_selection=False*)

Fill holes in the model surface.

Parameters

- **level** (*int*) – Hole size threshold in percents.
- **apply_to_selection** (*bool*) – Close holes within selection

copy()

Create a copy of the model.

Returns

Copy of the model.

Return type

Metashape.Model

cropSelection()

Crop selected faces and free vertices from the mesh.

crs

Reference coordinate system.

Type

Metashape.CoordinateSystem | None

data_type

Data type used to store color values.

Type

Metashape.DataType

enabled

Enables/disables the model.

Type

bool

faces

Collection of model faces.

Type*Metashape.Model.Faces***fixTopology()**

Remove polygons causing topological problems.

getActiveTexture(*type=Model.DiffuseMap*)

Return active texture.

Parameters**type** (*Metashape.Model.TextureType*) – Texture type.**Returns**

Texture image.

Return type*Metashape.Image***group**

Model group.

Type*Metashape.ModelGroup***invertSelection()**

Invert selection.

key

Model identifier.

Type

int

label

Model label.

Type

str

loadTexture(*path*)

Load texture from the specified file.

Parameters**path** (*str*) – Path to the image file.**meta**

Model meta data.

Type*Metashape.MetaData***modified**

Modified flag.

Type

bool

pickPoint(*origin, target, endpoints=1*)

Return ray intersection with mesh.

Parameters

- **origin** (*Metashape.Vector*) – Ray origin.
- **target** (*Metashape.Vector*) – Point on the ray.
- **endpoints** (*int*) – Number of endpoints to check for (0 - line, 1 - ray, 2 - segment).

Returns

Coordinates of the intersection point.

Return type

Metashape.Vector

remove(*items*)

Remove textures from the model.

Parameters

items (*list*[*Metashape.Model.Texture*]) – A list of textures to be removed.

removeComponents(*size*)

Remove small connected components.

Parameters

size (*int*) – Threshold on the polygon count of the components to be removed.

removeSelection()

Remove selected faces and free vertices from the mesh.

removeTextures()

Remove textures.

removeUV()

Remove UV mapping.

removeVertexColors()

Remove vertex colors.

removeVertexConfidence()

Remove confidence.

renderDepth(*transform, calibration, cull_faces=True, add_alpha=True*)

Render model depth image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **cull_faces** (*bool*) – Enable back-face culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

Returns

Rendered image.

Return type

Metashape.Image

renderImage(*transform, calibration, cull_faces=True, add_alpha=True, raster_transform=RasterTransformNone, matcap_image, smooth_normals=True, color*)

Render model image for specified viewpoint.

Parameters

- **transform** (`Metashape.Matrix`) – Camera location.
- **calibration** (`Metashape.Calibration`) – Camera calibration.
- **cull_faces** (`bool`) – Enable back-face culling.
- **add_alpha** (`bool`) – Generate image with alpha channel.
- **raster_transform** (`Metashape.RasterTransformType`) – Raster band transformation.
- **matcap_image** (`Metashape.Image`) – Matcap image used to shade model.
- **smooth_normals** – Enable normals smoothing.:type smooth_normals: bool
- **color** (`list[int]:return: Rendered image.`) – Solid view color.

Return type*Metashape.Image***renderMask**(*transform, calibration, cull_faces=True*)

Render model mask image for specified viewpoint.

Parameters

- **transform** (`Metashape.Matrix`) – Camera location.
- **calibration** (`Metashape.Calibration`) – Camera calibration.
- **cull_faces** (`bool`) – Enable back-face culling.

Returns

Rendered image.

Return type*Metashape.Image***renderNormalMap**(*transform, calibration, cull_faces=True, add_alpha=True*)

Render image with model normals for specified viewpoint.

Parameters

- **transform** (`Metashape.Matrix`) – Camera location.
- **calibration** (`Metashape.Calibration`) – Camera calibration.
- **cull_faces** (`bool`) – Enable back-face culling.
- **add_alpha** (`bool`) – Generate image with alpha channel.
- **smooth_normals** – Enable normals smoothing.:type smooth_normals: bool

Returns

Rendered image.

Return type*Metashape.Image***renderPreview**(*width = 2048, height = 2048[, transform][, progress]*)

Generate model preview image.

Parameters

- **width** (`int`) – Preview image width.
- **height** (`int`) – Preview image height.
- **transform** (`Metashape.Matrix`) – 4x4 viewpoint transformation matrix.

- **progress** (*Callable*[[float], None]) – Progress callback.

Returns

Preview image.

Return type

Metashape.Image

saveTexture(*path*)

Save texture to the specified file.

Parameters

path (*str*) – Path to the image file.

selected

Selects/deselects the model.

Type

bool

setActiveTexture(*texture*, *type=Model.DiffuseMap*)

Set active texture.

Parameters

- **texture** (*Metashape.Model.Texture*) – Texture to set.
- **type** (*Metashape.Model.TextureType*) – Texture type.

setVertexColors(*channels='RGB'*, *datatype='U8'*)

Clear vertex colors data and set layout.

Parameters

- **channels** (*str*) – color channel layout, e.g. 'RGB', 'RGBA', etc.
- **datatype** (*str*) – pixel data type in ['U8', 'U16', 'U32', 'F16', 'F32', 'F64']

statistics([*progress*])

Return model statistics.

Parameters

progress (*Callable*[[float], None]) – Progress callback.

Returns

Model statistics.

Return type

Metashape.Model.Statistics

tex_vertices

Collection of model texture vertices.

Type

Metashape.Model.TexVertices

textures

List of model textures.

Type

list[*Metashape.Model.Texture*]

transform

4x4 model transformation matrix.

Type

Metashape.Matrix

transformVertices(*transform*)

Transform vertex coordinates.

Parameters

transform (*Metashape.Matrix*) – 4x4 transformation matrix.

vertices

Collection of model vertices.

Type

Metashape.Model.Vertices

volume()

Return volume of the closed model surface.

Returns

Model volume.

Return type

float

class Metashape.ModelFormat

Model format in [ModelFormatNone, ModelFormatOBJ, ModelFormat3DS, ModelFormatVRML, ModelFormatPLY, ModelFormatCOLLADA, ModelFormatU3D, ModelFormatPDF, ModelFormatDXF, ModelFormatFBX, ModelFormatKMZ, ModelFormatCTM, ModelFormatSTL, ModelFormatDXF_3DF, ModelFormatTLS, ModelFormatABC, ModelFormatOSGB, ModelFormatOSGT, ModelFormatGLTF, ModelFormatX3D, ModelFormatLandXML]

class Metashape.ModelGroup

ModelGroup objects define groups of multiple models. The grouping is established by assignment of a ModelGroup instance to the Model.group attribute of participating models.

key

Model group identifier.

Type

int

label

Model group label.

Type

str

meta

Model group meta data.

Type

Metashape.MetaData

renderPreview(*width = 2048, height = 2048*[, *transform*][, *progress*])

Generate block model preview image.

Parameters

- **width** (*int*) – Preview image width.
- **height** (*int*) – Preview image height.
- **transform** (*Metashape.Matrix*) – 4x4 viewpoint transformation matrix.
- **progress** (*Callable[[float], None]*) – Progress callback.

Returns

Preview image.

Return type

Metashape.Image

selected

Current selection state.

Type

bool

class Metashape.NetworkClient

NetworkClient class provides access to the network processing server and allows to create and manage tasks.

The following example connects to the server and lists active tasks:

```
>>> import Metashape
>>> client = Metashape.NetworkClient()
>>> client.connect('127.0.0.1')
>>> client.batchList()
```

abortBatch(*batch_id*)

Abort batch.

Parameters

batch_id (*int*) – Batch id.

abortWorker(*worker_id*)

Abort worker.

Parameters

worker_id (*int*) – Worker id.

batchInfo(*batch_id*, *revision=0*)

Get batch information.

Parameters

- **batch_id** (*int*) – Batch id.
- **revision** (*int*) – First revision to get.

Returns

Batch information.

Return type

dict

batchList(*revision=0*)

Get list of batches.

Parameters

revision (*int*) – First revision to get.

Returns

List of batches.

Return type

dict

connect(*host*, *port=5840*)

Connect to the server.

Parameters

- **host** (*str*) – Server hostname.
- **port** (*int*) – Communication port.

createBatch(*path*, *tasks*[, *meta*])

Create new batch.

Parameters

- **path** (*str*) – Project path relative to root folder.
- **tasks** (*list* [*Metashape.NetworkTask*]) – List of processing tasks to execute.
- **meta** (*Metashape.MetaData*) – Batch metadata.

Returns

Batch id.

Return type

int

disconnect()

Disconnect from the server.

exportBatches([*batch_ids*])

Export current state of batches.

Parameters

batch_ids (*list* [*int*]) – List of batch ids to export.

Returns

Batches data.

Return type

str

findBatch(*path*)

Get batch id based on project path.

Parameters

path (*str*) – Project path relative to root folder.

Returns

Batch id.

Return type

int

importBatches(*data*)

Import batches from exported data.

Parameters

data (*str*) – Batches data.

quitWorker(*worker_id*)

Quit worker.

Parameters

worker_id (*int*) – Worker id.

serverInfo(*revision=0*)

Get server information.

Parameters

revision (*int*) – First revision to get.

Returns

Server information.

Return type

dict

serverVersion()

Get server version.

Returns

Server version.

Return type

dict

setBatchPaused(*batch_id, paused=True*)

Set batch paused state.

Parameters

- **batch_id** (*int*) – Batch id.
- **paused** (*bool*) – Paused state.

setBatchPriority(*batch_id, priority*)

Set batch priority.

Parameters

- **batch_id** (*int*) – Batch id.
- **priority** (*int*) – Batch priority (2 - Highest, 1 - High, 0 - Normal, -1 - Low, -2 - Lowest).

setBatchWorkerLimit(*batch_id, worker_limit*)

Set worker limit of the batch.

Parameters

- **batch_id** (*int*) – Batch id.
- **worker_limit** (*int*) – Worker limit of the batch (0 - unlimited).

setWorkerCapability(*worker_id, capability*)

Set worker capability.

Parameters

- **worker_id** (*int*) – Worker id.
- **capability** (*int*) – Worker capability (1 - CPU, 2 - GPU, 3 - Any).

setWorkerCpuEnabled(*worker_id*, *cpu_enabled*)

Set worker CPU enabled flag.

Parameters

- **worker_id** (*int*) – Worker id.
- **cpu_enabled** (*bool*) – CPU enabled flag.

setWorkerGpuMask(*worker_id*, *gpu_mask*)

Set worker GPU mask.

Parameters

- **worker_id** (*int*) – Worker id.
- **gpu_mask** (*int*) – GPU device mask.

setWorkerPaused(*worker_id*, *paused=True*)

Set worker paused state.

Parameters

- **worker_id** (*int*) – Worker id.
- **paused** (*bool*) – Paused state.

setWorkerPriority(*worker_id*, *priority*)

Set worker priority.

Parameters

- **worker_id** (*int*) – Worker id.
- **priority** (*int*) – Worker priority (2 - Highest, 1 - High, 0 - Normal, -1 - Low, -2 - Lowest).

workerInfo(*worker_id*, *revision=0*)

Get worker information.

Parameters

- **worker_id** (*int*) – Worker id.
- **revision** (*int*) – First revision to get.

Returns

Worker information.

Return type

dict

workerList(*revision=0*)

Get list of workers.

Parameters

- **revision** (*int*) – First revision to get.

Returns

List of workers.

Return type

dict

class Metashape.NetworkTask

NetworkTask class contains information about network task and its parameters.

The following example creates a new processing task and submits it to the server:

```
>>> import Metashape
>>> doc = Metashape.app.document
>>> match_photos = Metashape.Tasks.MatchPhotos()
>>> match_photos.keypoint_limit = 40000
>>> tasks = []
>>> tasks.append(match_photos.toNetworkTask(doc.chunk))
>>> client = Metashape.NetworkClient()
>>> client.connect('127.0.0.1')
>>> batch_id = client.createBatch(doc.path, tasks)
>>> client.setBatchPaused(batch_id, false)
```

chunks

List of chunks.

Type

list

frames

List of frames.

Type

list

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

params

Task parameters.

Type

dict

class Metashape.OrthoProjection

Orthographic projection.

class Type

Projection type in [Planar, Cylindrical]

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.OrthoProjection

crs

Base coordinate system.

Type

Metashape.CoordinateSystem

matrix

Ortho transformation matrix.

Type

Metashape.Matrix

radius

Cylindrical projection radius.

Type

float

transform(*point, source, target*)

Transform point coordinates between coordinate systems.

Parameters

- **point** (*Metashape.Vector*) – 2D or 3D point coordinates.
- **source** (*Metashape.OrthoProjection* / *Metashape.CoordinateSystem*) – Source coordinate system.
- **target** (*Metashape.OrthoProjection* / *Metashape.CoordinateSystem*) – Target coordinate system.

Returns

Transformed point coordinates.

Return type

Metashape.Vector

type

Projection type.

Type

Metashape.OrthoProjection.Type

class Metashape.Orthomosaic

Orthomosaic data.

The following sample assigns to the first shape in the chunk the image from the first camera for the orthomosaic patch and updates the mosaic:

```
>>> import Metashape
>>> chunk = Metashape.app.document.chunk
>>> ortho = chunk.orthomosaic
>>> camera = chunk.cameras[0]
>>> shape = chunk.shapes[0]
>>> patch = Metashape.Orthomosaic.Patch()
>>> patch.image_keys = [camera.key]
>>> ortho.patches[shape] = patch
>>> ortho.update()
```

class Patch

Orthomosaic patch.

copy()

Returns a copy of the patch.

Returns

Copy of the patch.

Return type

Metashape.Orthomosaic.Patch

excluded

Excluded flag.

Type

bool

image_keys

Image keys.

Type

list[int]

inpaint

Inpaint flag.

Type

bool

class Patches

A set of orthomosaic patches.

items()

List of items.

keys()

List of item keys.

values()

List of item values.

bands

List of color bands.

Type

list[str]

bottom

Y coordinate of the bottom side.

Type

float

camera(*point*)

Get camera used in orthomosaic at the specified point.

Parameters

point (*Metashape.Vector*) – Point coordinates in the orthomosaic coordinate system.

Returns

Camera used in orthomosaic.

Return type*Metashape.Camera***clear()**

Clears orthomosaic data.

copy()

Create a copy of the orthomosaic.

Returns

Copy of the orthomosaic.

Return type*Metashape.Orthomosaic***coverageArea()**Calculate coverage area of the orthomosaic in m². Only pixels with data are used.**Returns**

Area covered by the orthomosaic.

Return type

float

crs

Coordinate system of orthomosaic.

Type*Metashape.CoordinateSystem***data_type**

Data type used to store color values.

Type*Metashape.DataType***height**

Orthomosaic height.

Type

int

key

Orthomosaic identifier.

Type

int

label

Orthomosaic label.

Type

str

left

X coordinate of the left side.

Type

float

meta

Orthomosaic meta data.

Type

Metashape.MetaData

modified

Modified flag.

Type

bool

patches

Orthomosaic patches.

Type

Metashape.Orthomosaic.Patches

projection

Orthomosaic projection.

Type

Metashape.OrthoProjection

removeOrthophotos()

Remove orthorectified images from orthomosaic.

renderPreview(*width = 2048, height = 2048*[, *progress*])

Generate orthomosaic preview image.

Parameters

- **width** (*int*) – Preview image width.
- **height** (*int*) – Preview image height.
- **progress** (*Callable[[float], None]*) – Progress callback.

Returns

Preview image.

Return type

Metashape.Image

reset([*progress*])

Reset all edits to orthomosaic.

Parameters

progress (*Callable[[float], None]*) – Progress callback.

resolution

Orthomosaic resolution in meters.

Type

float

right

X coordinate of the right side.

Type

float

top

Y coordinate of the top side.

Type

float

update([*progress*])

Apply edits to orthomosaic.

Parameters

progress (*Callable*[[*float*], *None*]) – Progress callback.

width

Orthomosaic width.

Type

int

class `Metashape.Photo`

Photo instance

alpha()

Returns alpha channel data.

Returns

Alpha channel data.

Return type

Metashape.Image

copy()

Returns a copy of the photo.

Returns

Copy of the photo.

Return type

Metashape.Photo

image([*channels*][, *datatype*])

Returns image data.

Parameters

- **datatype** (*str*) – pixel data type in ['U8', 'U16', 'U32', 'F16', 'F32', 'F64']
- **channels** (*str*) – color channels to be loaded, e.g. 'RGB', 'RGBA', etc.

Returns

Image data.

Return type

Metashape.Image

imageMeta()

Returns image meta data.

Returns

Image meta data.

Return type

Metashape.MetaData

layer

Layer index in the image file.

Type
int

meta

Frame meta data.

Type
Metashape.MetaData

open(*path*, *layer=0*)

Loads specified image file.

Parameters

- **path** (*str*) – Path to the image file to be loaded.
- **layer** (*int*) – Layer index in case of multipage files.

path

Path to the image file.

Type
str

thumbnail(*width=192*, *height=192*)

Creates new thumbnail with specified dimensions.

Returns
Thumbnail data.

Return type
Metashape.Thumbnail

class Metashape.PointClass

Point class in [Created, Unclassified, Ground, LowVegetation, MediumVegetation, HighVegetation, Building, LowPoint, ModelKeyPoint, Water, Rail, RoadSurface, OverlapPoints, WireGuard, WireConductor, TransmissionTower, WireConnector, BridgeDeck, HighNoise, Car, Manmade]

class Metashape.PointCloud

Point cloud data.

class Point

Point of the point cloud

classification
Point classification.
Type
int

color
Point color.
Type
tuple[int | float, ...]

column_index
Point column index.
Type
int

confidence

Point confidence.

Type
int

intensity

Point intensity.

Type
int

normal

Point normal.

Type
Metashape.Vector

position

Point coordinates.

Type
Metashape.Vector

return_count

Point return count.

Type
int

return_index

Point return index.

Type
int

row_index

Point row index.

Type
int

scan_angle

Point scan angle.

Type
float

source_id

Point source id.

Type
int

timestamp

Point timestamp.

Type
float

class Points

List of point cloud points

class Reader

Point cloud reader.

column_count

Column count.

Type
int

has_point_classification

Has point classification.

Type
bool

has_point_color

Has point color.

Type
bool

has_point_confidence

Has point confidence.

Type
bool

has_point_index

Has point row and column indices.

Type
bool

has_point_intensity

Has point intensity.

Type
bool

has_point_normal

Has point normal.

Type
bool

has_point_return_number

Has point return number.

Type
bool

has_point_scan_angle

Has point scan angle.

Type
bool

has_point_source_id

Has point source id.

Type
bool

has_point_timestamp

Has point timestamp.

Type
bool

open(*point_cloud*)

Open point cloud for reading.

read(*count*)

Read specified number of points from the point cloud starting from the current position.

Parameters

count (*int*) – Number of points to read.

Returns

Points data.

Return type

Metashape.PointCloud.Points

reset()

Reset reading position to the first point in the cloud.

row_count

Row count.

Type

int

alignNormals(*direction* [, *point_classes*] [, *progress*])

Align selected point normals with specified direction.

Parameters

- **direction** (*Metashape.Vector*) – Normal direction in the chunk coordinate system.
- **point_classes** (*Metashape.PointClass* | *list*[*Metashape.PointClass*]) – Classes of points to process.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

assignClass(*target=0* [, *source*] [, *progress*])

Assign class to points.

Parameters

- **target** (*Metashape.PointClass*) – Target class.
- **source** (*Metashape.PointClass* | *list*[*Metashape.PointClass*]) – Classes of points to be replaced.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

assignClassToSelection(*target=0* [, *source*] [, *progress*])

Assign class to selected points.

Parameters

- **target** (*Metashape.PointClass*) – Target class.
- **source** (*Metashape.PointClass* | *list*[*Metashape.PointClass*]) – Classes of points to be replaced.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

bands

List of color bands.

Type

list[*str*]

classifyGroundPoints(*max_angle=10.0*, *max_distance=1.0*, *max_terrain_slope=10.0*, *cell_size=50.0*, *erosion_radius=0.0* [, *source_class*] [, *return_number*], *keep_existing=False* [, *progress*])

Classify points into ground and non ground classes.

Parameters

- **max_angle** (*float*) – Maximum angle (degrees).
- **max_distance** (*float*) – Maximum distance (meters).
- **max_terrain_slope** (*float*) – Maximum terrain slope angle (degrees).
- **cell_size** (*float*) – Cell size (meters).
- **erosion_radius** (*float*) – Erosion radius (meters).
- **source_class** (*Metashape.PointClass*) – Class of points to be re-classified.
- **return_number** (*int*) – Point return number to use (0 - any return, 1 - first return, -1 - last return).
- **keep_existing** (*bool*) – Keep existing ground points.
- **progress** (*Callable[[float], None]*) – Progress callback.

classifyOverlapPoints([, *progress*])

Classify overlap points.

Parameters

progress (*Callable[[float], None]*) – Progress callback.

classifyPoints([, *source*] [, *target*], *confidence=0.0* [, *progress*])

Multiclass classification of points.

Parameters

- **source** (*Metashape.PointClass*) – Class of points to be re-classified.
- **target** (*list[Metashape.PointClass]*) – Target point classes for classification.
- **confidence** (*float*) – Required confidence level from 0.0 to 1.0.
- **progress** (*Callable[[float], None]*) – Progress callback.

clear()

Clears point cloud data.

compactPoints([, *progress*])

Permanently removes deleted points from point cloud.

Parameters

progress (*Callable[[float], None]*) – Progress callback.

component

Point cloud component.

Type

Metashape.Component

copy()

Create a copy of the point cloud.

Returns

Copy of the point cloud.

Return type*Metashape.PointCloud***cropSelectedPoints**(*[point_classes]* [*, progress*])

Crop selected points.

Parameters

- **point_classes** (*Metashape.PointClass* / *list[Metashape.PointClass]*) – Classes of points to be removed.
- **progress** (*Callable[[float], None]*) – Progress callback.

crs

Reference coordinate system.

Type*Metashape.CoordinateSystem* | None**data_type**

Data type used to store color values.

Type*Metashape.DataType***enabled**

Enables/disables the point cloud.

Type

bool

extent(*[transform]*)

Get point cloud extent.

Parameters**transform** (*Metashape.Matrix*) – Optional transformation to apply to point coordinates.**Returns**

Point cloud extent.

Return type*Metashape.BBox***generatePanorama**(*ignore_colors=False* [*, progress*])

Generate panorama for structured point cloud.

Parameters

- **ignore_colors** (*bool*) – Use intensity information instead of point colors.
- **progress** (*Callable[[float], None]*) – Progress callback.

group

Point cloud group.

Type*Metashape.PointCloudGroup***invertNormals**(*[point_classes]* [*, progress*])

Invert selected point normals.

Parameters

- **point_classes** (*Metashape.PointClass* / *list[Metashape.PointClass]*) – Classes of points to process.
- **progress** (*Callable[[float], None]*) – Progress callback.

invertSelection()

Invert selection.

is_laser_scan

Use point cloud as laser scan.

Type
bool

key

Point cloud identifier.

Type
int

label

Point cloud label.

Type
str

meta

Point cloud meta data.

Type
Metashape.MetaData

modified

Modified flag.

Type
bool

pickPoint (*origin, target, endpoints=1*)

Returns ray intersection with the point cloud (point on the ray nearest to some point).

Parameters

- **origin** (*Metashape.Vector*) – Ray origin in the chunk coordinate system.
- **target** (*Metashape.Vector*) – Point on the ray in the chunk coordinate system.
- **endpoints** (*int*) – Number of endpoints to check for (0 - line, 1 - ray, 2 - segment).

Returns

Coordinates of the intersection point.

Return type

Metashape.Vector

point_count

Number of points in point cloud.

Type
int

point_count_by_class

Number of points in each class.

Type

dict

removePoints(*point_classes*[, *progress*])

Remove points.

Parameters

- **point_classes** (*Metashape.PointClass* | *list*[*Metashape.PointClass*]) – Classes of points to be removed.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

removeSelectedPoints([*point_classes*][, *progress*])

Remove selected points.

Parameters

- **point_classes** (*Metashape.PointClass* | *list*[*Metashape.PointClass*]) – Classes of points to be removed.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

renderDepth(*transform*, *calibration*, *point_size=1*, *resolution=1*, *cull_points=False*, *add_alpha=True*)

Render point cloud depth image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **point_size** (*int*) – Point size.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_points** (*bool*) – Enable normal based culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

Returns

Rendered image.

Return type

Metashape.Image

renderImage(*transform*, *calibration*, *point_size=1*, *resolution=1*, *cull_points=False*, *add_alpha=True*, *raster_transform=RasterTransformNone*)

Render point cloud image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **point_size** (*int*) – Point size.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_points** (*bool*) – Enable normal based culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

- **raster_transform** (`Metashape.RasterTransformType`) – Raster band transformation.

Returns

Rendered image.

Return type

Metashape.Image

renderMask(*transform, calibration, point_size=1, resolution=1, cull_points=False*)

Render point cloud mask image for specified viewpoint.

Parameters

- **transform** (`Metashape.Matrix`) – Camera location.
- **calibration** (`Metashape.Calibration`) – Camera calibration.
- **point_size** (*int*) – Point size.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_points** (*bool*) – Enable normal based culling.

Returns

Rendered image.

Return type

Metashape.Image

renderNormalMap(*transform, calibration, point_size=1, resolution=1, cull_points=False, add_alpha=True*)

Render image with point cloud normals for specified viewpoint.

Parameters

- **transform** (`Metashape.Matrix`) – Camera location.
- **calibration** (`Metashape.Calibration`) – Camera calibration.
- **point_size** (*int*) – Point size.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_points** (*bool*) – Enable normal based culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

Returns

Rendered image.

Return type

Metashape.Image

renderPreview(*width = 2048, height = 2048*[, *transform*], *point_size=1*[, *progress*])

Generate point cloud preview image.

Parameters

- **width** (*int*) – Preview image width.
- **height** (*int*) – Preview image height.
- **transform** (`Metashape.Matrix`) – 4x4 viewpoint transformation matrix.
- **point_size** (*int*) – Point size.
- **progress** (`Callable[[float], None]`) – Progress callback.

Returns

Preview image.

Return type

Metashape.Image

resetFilters()

Reset filters.

restorePoints(*[point_classes]* [, *progress*])

Restore deleted points.

Parameters

- **point_classes** (*Metashape.PointClass* | *list[Metashape.PointClass]*) – Classes of points to be restored.
- **progress** (*Callable[[float], None]*) – Progress callback.

selectMaskedPoints(*cameras, softness=4, only_visible=False* [, *progress*])

Select points based on image masks.

Parameters

- **cameras** (*list[Metashape.Camera]*) – A list of cameras to use for selection.
- **softness** (*float*) – Mask edge softness.
- **only_visible** (*bool*) – Select visible points only.
- **progress** (*Callable[[float], None]*) – Progress callback.

selectPointsByColor(*color, tolerance=10, channels='RGB'* [, *progress*])

Select points based on point colors.

Parameters

- **color** (*list[int]*) – Color to select.
- **tolerance** (*int*) – Color tolerance.
- **channels** (*str*) – Combination of color channels to compare in ['R', 'G', 'B', 'H', 'S', 'V'].
- **progress** (*Callable[[float], None]*) – Progress callback.

selectPointsByRegion(*region*)

Select points inside box region.

Parameters

region (*Metashape.Region*) – Box region to select in chunk coordinates

selectPointsByShapes(*[shapes]* [, *progress*])

Select points based on shapes.

Parameters

- **shapes** (*list[Metashape.Shape]*) – A list of shapes to use for selection (selected shapes if not specified).
- **progress** (*Callable[[float], None]*) – Progress callback.

selected

Selects/deselects the point cloud.

Type

bool

setClassesFilter(*point_classes*)

Set filter by point classes.

Parameters

point_classes (`Metashape.PointClass` | `list[Metashape.PointClass]`) – List of point classes.

setConfidenceFilter(*min_confidence*, *max_confidence*)

Set filter by confidence.

Parameters

- **min_confidence** (*int*) – Minimum confidence value.
- **max_confidence** (*int*) – Maximum confidence value.

setPointReturnsFilter(*first_return=True*, *middle_return=True*, *last_return=True*, *single_return=True*)

Set filter by point return.

Parameters

- **first_return** (*bool*) – First return.
- **middle_return** (*bool*) – Intermediate return.
- **last_return** (*bool*) – Last return.
- **single_return** (*bool*) – Single return.

setSelectionFilter()

Set filter by selection.

transform

4x4 point cloud transformation matrix.

Type

Metashape.Matrix

updateStatistics([*progress*])

Update point cloud statistics.

Parameters

progress (`Callable[[float], None]`) – Progress callback.

class Metashape.PointCloudFormat

Point cloud format in [PointCloudFormatNone, PointCloudFormatOBJ, PointCloudFormatPLY, PointCloudFormatXYZ, PointCloudFormatLAS, PointCloudFormatExpe, PointCloudFormatU3D, PointCloudFormatPDF, PointCloudFormatE57, PointCloudFormatOC3, PointCloudFormatPotree, PointCloudFormatLAZ, PointCloudFormatCL3, PointCloudFormatPTS, PointCloudFormatPTX, PointCloudFormatDXF, PointCloudFormatCesium, PointCloudFormatPCD, PointCloudFormatSLPK, PointCloudFormatCOPC, PointCloudFormatCSV]

class Metashape.PointCloudGroup

PointCloudGroup objects define groups of multiple laser scans. The grouping is established by assignment of a PointCloudGroup instance to the PointCloud.group attribute of participating laser scans.

crs

Reference coordinate system.

Type

Metashape.CoordinateSystem | None

fixed

Fix relative laser scan positions within the group.

Type

bool

key

Asset group identifier.

Type

int

label

Point cloud group label.

Type

str

meta

Asset group meta data.

Type

Metashape.MetaData

selected

Current selection state.

Type

bool

transform

4x4 asset group transformation matrix.

Type

Metashape.Matrix

class Metashape.Preselection

Image pair preselection in [NoPreselection, GenericPreselection, ReferencePreselection]

class Metashape.RPCModel

Rational polynomial model.

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.RPCModel

error(point, proj)

Returns projection error.

Parameters

- **point** (*Metashape.Vector*) – Coordinates of the point to be projected.
- **proj** (*Metashape.Vector*) – Pixel coordinates of the point.

Returns

2D projection error.

Return type

Metashape.Vector

image_offset

Image coordinate offset.

Type

Metashape.Vector

image_scale

Image coordinate scale.

Type

Metashape.Vector

line_den_coeff

Line denominator.

Type

Metashape.Vector

line_num_coeff

Line numerator.

Type

Metashape.Vector

load(*path*[, *format*])

Load RPC model from file.

Parameters

- **path** (*str*) – Path to RPC model file.
- **format** (*str*) – RPC model file format in ['rpc', 'rpb', 'dimap']. Tiled DIMAP files are not supported.

object_offset

Object coordinate offset.

Type

Metashape.Vector

object_scale

Object coordinate scale.

Type

Metashape.Vector

project(*point*)

Returns projected pixel coordinates of the point.

Parameters

- **point** (*Metashape.Vector*) – Coordinates of the point to be projected.

Returns

2D projected point coordinates.

Return type

Metashape.Vector

samp_den_coeff

Sample denominator.

Type

Metashape.Vector

samp_num_coeff

Sample numerator.

Type

Metashape.Vector

save(*path*[, *format*])

Save RPC model to file.

Parameters

- **path** (*str*) – Path to RPC model file.
- **format** (*str*) – RPC model file format in ['rpc', 'rpb'].

unproject(*point*)

Returns direction corresponding to the image point.

Parameters

point (*Metashape.Vector*) – Pixel coordinates of the point.

Returns

3D vector in the camera coordinate system.

Return type

Metashape.Vector

class Metashape.RasterFormat

Raster format in [RasterFormatNone, RasterFormatTiles, RasterFormatKMZ, RasterFormatXYZ, RasterFormatMBTiles, RasterFormatWW, RasterFormatTMS, RasterFormatGeoPackage]

class Metashape.RasterTransform

Raster transform definition.

calibrateRange()

Auto detect range based on orthomosaic histogram.

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.RasterTransform

enabled

Enable flag.

Type

bool

false_color

False color channels.

Type
list

formula

Raster calculator expression.

Type
str

interpolation

Interpolation enable flag.

Type
bool

palette

Color palette.

Type
dict

range

Palette mapping range.

Type
tuple

reset()

Reset raster transform.

class Metashape.RasterTransformType

Raster transformation type in [RasterTransformNone, RasterTransformValue, RasterTransformPalette]

class Metashape.ReferenceFormat

Reference format in [ReferenceFormatNone, ReferenceFormatXML, ReferenceFormatTEL, ReferenceFormatCSV, ReferenceFormatMavinci, ReferenceFormatBramor, ReferenceFormatAPM]

class Metashape.ReferenceItems

Reference items in [ReferenceItemsCameras, ReferenceItemsMarkers, ReferenceItemsScalebars, ReferenceItemsAll]

class Metashape.ReferencePreselectionMode

Reference preselection mode in [ReferencePreselectionSource, ReferencePreselectionEstimated, ReferencePreselectionSequential]

class Metashape.Region

Region parameters

center

Region center coordinates.

Type
Metashape.Vector

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.Region

rot

Region rotation matrix.

Type

Metashape.Matrix

size

Region size.

Type

Metashape.Vector

class Metashape.RotationOrder

Rotation order in [RotationOrderXYZ, RotationOrderXZY, RotationOrderYXZ, RotationOrderYZX, RotationOrderZXY, RotationOrderZYX]

class Metashape.Scalebar

Scale bar instance

class Reference

Scale bar reference data

accuracy

Scale bar length accuracy.

Type

float

distance

Scale bar length.

Type

float

enabled

Enabled flag.

Type

bool

chunk

Chunk the scalebar belongs to.

Type

Metashape.Chunk

frames

Scale bar frames.

Type

list[*Metashape.Scalebar*]

group

Scale bar group.

Type

Metashape.ScalebarGroup

key

Scale bar identifier.

Type
int

label

Scale bar label.

Type
str

meta

Scale bar meta data.

Type
Metashape.MetaData

point0

Start of the scale bar.

Type
Metashape.Marker | *Metashape.Camera*

point1

End of the scale bar.

Type
Metashape.Marker | *Metashape.Camera*

reference

Scale bar reference data.

Type
Metashape.Scalebar.Reference

selected

Selects/deselects the scale bar.

Type
bool

class Metashape.ScalebarGroup

ScalebarGroup objects define groups of multiple scale bars. The grouping is established by assignment of a ScalebarGroup instance to the Scalebar.group attribute of participating scale bars.

key

Scale bar group identifier.

Type
int

label

Scale bar group label.

Type
str

selected

Current selection state.

Type
bool

class Metashape.Sensor

Sensor instance

class Reference

Sensor reference data.

accuracy

Sensor location accuracy.

Type
Metashape.Vector

enabled

Location enabled flag.

Type
bool

location

Sensor coordinates.

Type
Metashape.Vector

location_accuracy

Sensor location accuracy.

Type
Metashape.Vector

location_enabled

Location enabled flag.

Type
bool

rotation

Sensor rotation angles.

Type
Metashape.Vector

rotation_accuracy

Sensor rotation accuracy.

Type
Metashape.Vector

rotation_enabled

Rotation enabled flag.

Type
bool

class Type

Sensor type in [Frame, Fisheye, Spherical, Cylindrical, RPC]

antenna

GPS antenna correction.

Type
Metashape.Antenna

bands

List of color bands.

Type

list[str]

black_level

Black level for each band.

Type

list[float]

calibrateFiducials(*resolution=0.014*)

Fit fiducial coordinates to image measurements.

Parameters

resolution (*float*) – Scanning resolution in mm/pix.

calibration

Adjusted calibration of the photo.

Type

Metashape.Calibration

chunk

Chunk the sensor belongs to.

Type

Metashape.Chunk

data_type

Data type used to store color values.

Type

Metashape.DataType

fiducials

Fiducial marks.

Type

list[*Metashape.Marker*]

film_camera

Film camera flag.

Type

bool

fixed

Fix calibration flag.

Type

bool

fixed_calibration

Fix calibration flag.

Type

bool

fixed_location

Fix location flag.

Type
bool

fixed_params

List of fixed calibration parameters.

Type
list[str]

fixed_rotation

Fix rotation flag.

Type
bool

focal_length

Focal length in mm.

Type
float

height

Image height.

Type
int

key

Sensor identifier.

Type
int

label

Sensor label.

Type
str

layer_index

Sensor layer index.

Type
int

location

Sensor plane location.

Type
Metashape.Vector

location_covariance

Sensor plane location covariance.

Type
Metashape.Matrix

makeMaster()

Make this sensor master in the multi-camera system.

master

Master sensor.

Type

Metashape.Sensor

meta

Sensor meta data.

Type

Metashape.MetaData

normalize_sensitivity

Enable sensitivity normalization.

Type

bool

normalize_to_float

Convert pixel values to floating point after normalization.

Type

bool

photo_params

List of image-variant calibration parameters.

Type

list[str]

pixel_height

Pixel height in mm.

Type

float

pixel_size

Pixel size in mm.

Type

Metashape.Vector

pixel_width

Pixel width in mm.

Type

float

planes

Sensor planes.

Type

list[*Metashape.Sensor*]

reference

Sensor reference data.

Type

Metashape.Sensor.Reference

rolling_shutter

Enable rolling shutter compensation.

Type

Metashape.Shutter.Model

rotation

Sensor plane rotation.

Type

Metashape.Matrix

rotation_covariance

Sensor plane rotation covariance.

Type

Metashape.Matrix

sensitivity

Sensitivity for each band.

Type

list[float]

type

Sensor projection model.

Type

Metashape.Sensor.Type

user_calib

Custom calibration used as initial calibration during photo alignment.

Type

Metashape.Calibration

vignetting

Vignetting for each band.

Type

list[*Metashape.Vignetting*]

width

Image width.

Type

int

class Metashape.ServiceType

Service type in [ServiceSketchfab, ServiceMapbox, Service4DMapper, ServiceAgisoftCloud, Service-Pointscene, ServicePointbox, ServicePicterra, ServiceCesium, ServiceNira]

class Metashape.Shape

Shape data.

class BoundaryType

Shape boundary type in [NoBoundary, OuterBoundary, InnerBoundary]

class Vertices

Collection of shape vertices

area()

Return area of the shape on DEM.

Returns

Shape area.

Return type

float

areaFitted()

Return 2D area of the shape projected onto the best fitting plane.

Returns

Shape area.

Return type

float

attributes

Shape attributes.

Type

Metashape.MetaData

boundary_type

Shape boundary type.

Type

Metashape.Shape.BoundaryType

geometry

Shape geometry.

Type

Metashape.Geometry | *Metashape.AttachedGeometry*

group

Shape group.

Type

Metashape.ShapeGroup

is_attached

Attached flag.

Type

bool

key

Shape identifier.

Type

int

label

Shape label.

Type

str

perimeter2D()

Return perimeter of the shape on DEM.

Returns

Shape perimeter.

Return type

float

perimeter3D()

Return perimeter of the shape.

Returns

Shape perimeter.

Return type

float

selected

Selects/deselects the shape.

Type

bool

volume(*level='bestfit'*)

Return volume of the shape measured on DEM above and below best fit, mean level or custom level plane.

Parameters

level (*float*) – Plane level: 'bestfit', 'mean' or custom value.

Returns

Shape volumes.

Return type

dict

class Metashape.ShapeGroup

ShapeGroup objects define groups of multiple shapes. The grouping is established by assignment of a ShapeGroup instance to the Shape.group attribute of participating shapes.

color

Shape group color.

Type

tuple[int, int, int, int]

enabled

Enable flag.

Type

bool

key

Shape group identifier.

Type

int

label

Shape group label.

Type
str

meta

Shape group meta data.

Type
Metashape.MetaData

selected

Current selection state.

Type
bool

show_labels

Shape labels visibility flag.

Type
bool

class Metashape.Shapes

A set of shapes for a chunk frame.

addGroup()

Add new shape group to the set of shapes.

Returns
Created shape group.

Return type
Metashape.ShapeGroup

addShape()

Add new shape to the set of shapes.

Returns
Created shape.

Return type
Metashape.Shape

crs

Shapes coordinate system.

Type
Metashape.CoordinateSystem

group

Default shape group.

Type
Metashape.ShapeGroup

groups

List of shape groups.

Type
list[*Metashape.ShapeGroup*]

items()

List of items.

meta

Shapes meta data.

Type

Metashape.MetaData

modified

Modified flag.

Type

bool

projection

Shapes projection.

Type

Metashape.OrthoProjection

remove(items)

Remove items from the shape layer.

Parameters

items (*list*[*Metashape.Shape* / *Metashape.ShapeGroup*]) – A list of items to be removed.

shapes

List of shapes.

Type

list[*Metashape.Shape*]

updateAltitudes(items[, progress])

Update altitudes for items.

Parameters

- **items** (*list*[*Metashape.Shape* / *Metashape.ShapeGroup*]) – A list of items to be updated.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

class Metashape.ShapesFormat

Shapes format in [*ShapesFormatNone*, *ShapesFormatSHP*, *ShapesFormatKML*, *ShapesFormatDXF*, *ShapesFormatGeoJSON*, *ShapesFormatGeoPackage*, *ShapesFormatCSV*]

class Metashape.Shutter

Shutter object contains estimated parameters of the rolling shutter correction model.

class Model

Rolling shutter model in [*Disabled*, *Regularized*, *Full*]

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.Shutter

rotation

Rotation matrix of the rolling shutter model.

Type

Metashape.Matrix

translation

Translation vector of the rolling shutter model.

Type

Metashape.Vector

class Metashape.SurfaceType

Surface type in [Arbitrary, HeightField]

class Metashape.Target

Target parameters

code

Target code.

Type

int

coord

Target location.

Type

Metashape.Vector

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.Target

radius

Target radius.

Type

float

class Metashape.TargetType

Target type in [CircularTarget12bit, CircularTarget14bit, CircularTarget16bit, CircularTarget20bit, CircularTarget, CrossTarget, AprilTag16h5, AprilTag25h9, AprilTag36h10, AprilTag36h11, AprilTagCircle21h7, AprilTagStandard41h12, AprilTagStandard52h13]

class Metashape.Tasks

Task classes.

class AddFrames

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (`Metashape.Chunk` / `Metashape.Document`) – Chunk or Document object to be processed.
- **workitem** (`int`) – Workitem index.
- **progress** (`Callable[[float], None]`) – Progress callback.

chunk

Chunk to copy frames from.

Type
int

copy_depth_maps

Copy depth maps.

Type
bool

copy_elevation

Copy DEM.

Type
bool

copy_model

Copy model.

Type
bool

copy_orthomosaic

Copy orthomosaic.

Type
bool

copy_point_cloud

Copy point cloud.

Type
bool

copy_tiled_model

Copy tiled model.

Type
bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frame keys to copy.

Type
list[int]

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class AddPhotos

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filegroups

List of file groups.

Type
list[int]

filenames

List of files to add.

Type
list[str]

gpu_support

GPU support flag.

Type
bool

group

Camera group key.

Type
int

layout

Image layout.

Type
Metashape.ImageLayout

load_reference

Load reference coordinates.

Type
bool

load_rpc_txt

Load satellite RPC data from auxiliary TXT files.

Type
bool

load_xmp_accuracy

Load accuracy from XMP meta data.

Type
bool

load_xmp_antenna

Load GNSS/INS offset from XMP meta data.

Type
bool

load_xmp_calibration

Load calibration from XMP meta data.

Type
bool

load_xmp_orientation

Load orientation from XMP meta data.

Type
bool

name

Task name.

Type
str

strip_extensions

Strip file extensions from camera labels.

Type
bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type

int

class AlignCameras

Task class containing processing parameters.

adaptive_fitting

Enable adaptive fitting of distortion coefficients.

Type

bool

align_laser_scans

Align laser scans using geometric features.

Type

bool

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

cameras

List of cameras to align.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

min_image

Minimum number of point projections.

Type

int

name

Task name.

Type

str

point_clouds

List of point clouds to align.

Type

list[int]

reset_alignment

Reset current alignment.

Type

bool

subdivide_task

Enable fine-level task subdivision.

Type

bool

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class AlignChunks

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

chunks

List of chunks to be aligned.

Type

list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

downscale

Alignment accuracy (0 - Highest, 1 - High, 2 - Medium, 4 - Low, 8 - Lowest).

Type

int

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filter_mask

Filter points by mask.

Type

bool

fit_scale

Fit chunk scale during alignment.

Type

bool

generic_preselection

Enables image pair preselection.

Type

bool

gpu_support

GPU support flag.

Type

bool

keypoint_limit

Maximum number of points for each photo.

Type

int

markers

List of markers to be used for marker based alignment.

Type

list[int]

mask_tiepoints

Apply mask filter to tie points.

Type

bool

method

Alignment method (0 - point based, 1 - marker based, 2 - camera based).

Type
int

name

Task name.

Type
str

reference

Chunk to be used as a reference.

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class AnalyzeImages

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to be analyzed.

Type
list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filter_mask

Constrain analyzed image region by mask.

Type

bool

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class BuildContours

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

interval

Contour interval.

Type
float

max_value

Maximum value of contour range.

Type
float

min_value

Minimum value of contour range.

Type
float

name

Task name.

Type
str

prevent_intersections

Prevent contour intersections.

Type
bool

source_data

Source data for contour generation.

Type
Metashape.DataSource

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class BuildDem

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.

- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

classes

List of point classes to be used for surface extraction.

Type
list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

flip_x

Flip X axis direction.

Type
bool

flip_y

Flip Y axis direction.

Type
bool

flip_z

Flip Z axis direction.

Type
bool

frames

List of frames to process.

Type
list[int]

gpu_support

GPU support flag.

Type
bool

interpolation

Interpolation mode.

Type
Metashape.Interpolation

max_workgroup_size

Maximum workgroup size.

Type
int

name

Task name.

Type
str

projection

Output projection.

Type
Metashape.OrthoProjection

region

Region to be processed.

Type
Metashape.BBox

replace_asset

Replace default asset with generated DEM.

Type
bool

resolution

Output resolution in meters.

Type
float

source_data

Selects between point cloud and tie points.

Type
Metashape.DataSource

subdivide_task

Enable fine-level task subdivision.

Type
bool

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

workitem_size_tiles

Number of tiles in a workitem.

Type
int

class BuildDepthMaps

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

downscale

Depth map quality (1 - Ultra high, 2 - High, 4 - Medium, 8 - Low, 16 - Lowest).

Type

int

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filter_mode

Depth map filtering mode.

Type

Metashape.FilterMode

gpu_support

GPU support flag.

Type

bool

max_neighbors

Maximum number of neighbor images to use for depth map generation.

Type

int

max_workgroup_size

Maximum workgroup size.

Type

int

name

Task name.

Type

str

reuse_depth

Enable reuse depth maps option.

Type

bool

subdivide_task

Enable fine-level task subdivision.

Type

bool

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask**([*objects*])Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.**workitem_count**

Work item count.

Type

int

workitem_size_cameras

Number of cameras in a workitem.

Type

int

class BuildModel

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

blocks_crs

Blocks grid coordinate system.

Type*Metashape.CoordinateSystem***blocks_origin**

Blocks grid origin.

Type*Metashape.Vector***blocks_size**

Blocks size in coordinate system units.

Type

float

build_texture

Generate preview textures.

Type

bool

cameras

List of cameras to process.

Type

list[int]

classes

List of point classes to be used for surface extraction.

Type

list[int]

clip_to_boundary

Clip to boundary shapes.

Type

bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

export_blocks

Export completed blocks.

Type

bool

face_count

Target face count.

Type

Metashape.FaceCount

face_count_custom

Custom face count.

Type

int

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

interpolation

Interpolation mode.

Type*Metashape.Interpolation***keep_depth**

Enable store depth maps option.

Type

bool

max_workgroup_size

Maximum workgroup size.

Type

int

name

Task name.

Type

str

output_folder

Path to output folder.

Type

str

replace_asset

Replace default asset with generated model.

Type

bool

source_data

Selects between point cloud, tie points, depth maps and laser scans.

Type*Metashape.DataSource***split_in_blocks**

Split model in blocks.

Type

bool

subdivide_task

Enable fine-level task subdivision.

Type

bool

surface_type

Type of object to be reconstructed.

Type*Metashape.SurfaceType***target**

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (`Metashape.Document` / `Metashape.Chunk` / `list[Metashape.Chunk]`) – Objects to be processed.

trimming_radius

Trimming radius (no trimming if zero).

Type

int

vertex_colors

Enable vertex colors calculation.

Type

bool

vertex_confidence

Enable vertex confidence calculation.

Type

bool

volumetric_masks

Enable strict volumetric masking.

Type

bool

workitem_count

Work item count.

Type

int

workitem_size_cameras

Number of cameras in a workitem.

Type

int

class BuildOrthomosaic

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (`Metashape.Chunk` / `Metashape.Document`) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (`Callable[[float], None]`) – Progress callback.

blending_mode

Orthophoto blending mode.

Type

`Metashape.BlendingMode`

cull_faces

Enable back-face culling.

Type

bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fill_holes

Enable hole filling.

Type

bool

flip_x

Flip X axis direction.

Type

bool

flip_y

Flip Y axis direction.

Type

bool

flip_z

Flip Z axis direction.

Type

bool

frames

List of frames to process.

Type

list[int]

ghosting_filter

Enable ghosting filter.

Type

bool

gpu_support

GPU support flag.

Type

bool

max_workgroup_size

Maximum workgroup size.

Type

int

name

Task name.

Type

str

projection

Output projection.

Type

Metashape.OrthoProjection

refine_seamlines

Refine seamlines based on image content.

Type

bool

region

Region to be processed.

Type

Metashape.BBox

replace_asset

Replace default asset with generated orthomosaic.

Type

bool

resolution

Pixel size in meters.

Type

float

resolution_x

Pixel size in the X dimension in projected units.

Type

float

resolution_y

Pixel size in the Y dimension in projected units.

Type

float

subdivide_task

Enable fine-level task subdivision.

Type

bool

surface_data

Orthorectification surface.

Type

Metashape.DataSource

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

transfer_texture

Transfer model texture to orthomosaic.

Type

bool

use_occlusion_texture

Use model occlusion texture.

Type

bool

use_point_cloud_intensity

Use point cloud intensity as color source.

Type

bool

workitem_count

Work item count.

Type

int

workitem_size_cameras

Number of cameras in a workitem.

Type

int

workitem_size_tiles

Number of tiles in a workitem.

Type

int

class BuildPanorama

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** ([Metashape.Chunk](#) / [Metashape.Document](#)) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** ([Callable](#)[[*float*], *None*]) – Progress callback.

blending_mode

Panorama blending mode.

Type[Metashape.BlendingMode](#)**camera_groups**

List of camera groups to process.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type

list[int]

ghosting_filter

Enable ghosting filter.

Type

bool

gpu_support

GPU support flag.

Type

bool

height

Height of output panorama.

Type

int

name

Task name.

Type

str

region

Region to be generated.

Type

Metashape.BBox

rotation

Panorama 3x3 orientation matrix.

Type

Metashape.Matrix

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

width

Width of output panorama.

Type

int

workitem_count

Work item count.

Type
int

class BuildPointCloud

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

asset

Asset to process.

Type
int

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type
list[int]

gpu_support

GPU support flag.

Type
bool

keep_depth

Enable store depth maps option.

Type
bool

max_neighbors

Maximum number of neighbor images to use for depth map filtering.

Type
int

max_workgroup_size

Maximum workgroup size.

Type
int

name

Task name.

Type
str

point_colors

Enable point colors calculation.

Type
bool

point_confidence

Enable point confidence calculation.

Type
bool

points_spacing

Desired point spacing (m).

Type
float

replace_asset

Replace default asset with generated point cloud.

Type
bool

source_data

Source data to extract points from.

Type
Metashape.DataSource

subdivide_task

Enable fine-level task subdivision.

Type
bool

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

uniform_sampling

Enable uniform point sampling.

Type
bool

workitem_count

Work item count.

Type
int

workitem_size_cameras

Number of cameras in a workitem.

Type
int

class BuildSeamlines

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

epsilon

Contour simplification threshold.

Type
float

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

- **objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class BuildTexture

Task class containing processing parameters.

anti_aliasing

Anti-aliasing coefficient for baking

Type
int

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

blending_mode

Texture blending mode.

Type
Metashape.BlendingMode

cameras

A list of cameras to be used for texturing.

Type
list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fill_holes

Enable hole filling.

Type
bool

ghosting_filter

Enable ghosting filter.

Type
bool

gpu_support

GPU support flag.

Type
bool

max_workgroup_size

Maximum workgroup size (block model only).

Type
int

name

Task name.

Type
str

source_asset

Source asset.

Type
int

source_data

Source data to create texture from.

Type
Metashape.DataSource

target

Task target.

Type
Metashape.Tasks.TargetType

texture_size

Texture page size.

Type
int

texture_type

Texture type.

Type
Metashape.Model.TextureType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

transfer_texture

Transfer texture.

Type
bool

workitem_count

Work item count.

Type
int

workitem_size_cameras

Number of cameras in a workitem (block model only).

Type
int

class BuildTiledModel

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

classes

List of point classes to be used for surface extraction.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

face_count

Number of faces per megapixel of texture resolution.

Type

int

frames

List of frames to process.

Type

list[int]

ghosting_filter

Enable ghosting filter.

Type

bool

gpu_support

GPU support flag.

Type

bool

keep_depth

Enable store depth maps option.

Type

bool

max_workgroup_size

Maximum workgroup size.

Type

int

merge

Merge tiled model flag.

Type

bool

name

Task name.

Type

str

operand_asset

Operand asset key.

Type

int

operand_chunk

Operand chunk key.

Type

int

operand_frame

Operand frame key.

Type

int

pixel_size

Target model resolution in meters.

Type

float

replace_asset

Replace default asset with generated tiled model.

Type

bool

source_data

Selects between point cloud and mesh.

Type

Metashape.DataSource

subdivide_task

Enable fine-level task subdivision.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

tile_size

Size of tiles in pixels.

Type

int

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

transfer_texture

Transfer source model texture to tiled model.

Type

bool

workitem_count

Work item count.

Type

int

workitem_size_cameras

Number of cameras in a workitem.

Type

int

class BuildUV

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

camera

Camera to be used for texturing in CameraMapping mode.

Type

int

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

mapping_mode

Texture mapping mode.

Type*Metashape.MappingMode***name**

Task name.

Type

str

page_count

Number of texture pages to generate.

Type

int

pixel_size

Texture resolution in meters.

Type

float

target

Task target.

Type*Metashape.Tasks.TargetType***texture_size**

Expected size of texture page at texture generation step.

Type

int

toNetworkTask([objects])Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class CalculatePointNormals

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

point_cloud

Point cloud key to process.

Type

int

point_neighbors

Number of point neighbors to use for normal estimation.

Type

int

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class CalibrateCamera

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

border

Border size to ignore.

Type

int

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fit_b1

Enable optimization of aspect ratio.

Type

bool

fit_b2

Enable optimization of skew coefficient.

Type

bool

fit_cxcy

Enable optimization of principal point coordinates.

Type

bool

fit_f

Enable optimization of focal length coefficient.

Type

bool

fit_k1

Enable optimization of k1 radial distortion coefficient.

Type

bool

fit_k2

Enable optimization of k2 radial distortion coefficient.

Type

bool

fit_k3

Enable optimization of k3 radial distortion coefficient.

Type

bool

fit_k4

Enable optimization of k4 radial distortion coefficient.

Type

bool

fit_p1

Enable optimization of p1 tangential distortion coefficient.

Type

bool

fit_p2

Enable optimization of p2 tangential distortion coefficient.

Type

bool

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class CalibrateColors

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to calibrate.

Type

list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

source_data

Source data for calibration.

Type

Metashape.DataSource

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

white_balance

Calibrate white balance.

Type

bool

workitem_count

Work item count.

Type

int

class CalibrateReflectance

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

use_reflectance_panels

Use calibrated reflectance panels.

Type

bool

use_sun_sensor

Apply irradiance sensor measurements.

Type

bool

workitem_count

Work item count.

Type

int

class ClassifyGroundPoints

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cell_size

Cell size (meters).

Type

float

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

erosion_radius

Erosion radius (meters).

Type

float

gpu_support

GPU support flag.

Type

bool

keep_existing

Keep existing ground points.

Type

bool

max_angle

Maximum angle (degrees).

Type

float

max_distance

Maximum distance (meters).

Type

float

max_terrain_slope

Maximum terrain slope angle (degrees).

Type

float

name

Task name.

Type

str

point_cloud

Point cloud key to classify.

Type

int

return_number

Point return number to use (0 - any return, 1 - first return, -1 - last return).

Type

int

source_class

Class of points to be re-classified.

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ClassifyOverlapPoints

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

point_cloud

Point cloud key to classify.

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ClassifyPoints

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

confidence

Required confidence level.

Type
float

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

point_cloud

Point cloud key to classify.

Type
int

source_class

Class of points to be re-classified.

Type
int

subdivide_task

Enable fine-level task subdivision.

Type
bool

target

Task target.

Type
Metashape.Tasks.TargetType

target_classes

Target point classes for classification.

Type
list[int]

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / list[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type
int

class CleanModel

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

criterion

Model filtering criterion.

Type
Metashape.Model.Criterion

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

level

Filtering threshold in percents.

Type

int

model

Model to filter.

Type

int

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class CleanTiePoints

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

criterion

Tie points filtering criterion.

Type

Metashape.TiePoints.Criterion

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

threshold

Filtering threshold.

Type

float

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class CloseHoles

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.

- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

apply_to_selection

Close holes within selection.

Type

bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

level

Hole size threshold in percents.

Type

int

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ColorizeModel

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.

- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

model

Key of model to colorize.

Type

int

name

Task name.

Type

str

source_data

Source data to extract colors from.

Type

Metashape.DataSource

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ColorizePointCloud

Task class containing processing parameters.

apply(*object*, [*workitem*], [*progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type
list[int]

gpu_support

GPU support flag.

Type
bool

max_workgroup_size

Maximum workgroup size.

Type
int

name

Task name.

Type
str

point_cloud

Point cloud key to colorize.

Type
int

replace_asset

Replace source point cloud with colorized one.

Type
bool

source_data

Source data to extract colors from.

Type
Metashape.DataSource

subdivide_task

Enable fine-level task subdivision.

Type
bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

workitem_size_cameras

Number of cameras in a workitem.

Type

int

class CompactPointCloud

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

point_cloud

Point cloud key to process.

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ConvertImages

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type
list[int]

color_correction

Apply color correction.

Type
bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

image_compression

Image compression parameters.

Type

Metashape.ImageCompression

merge_planes

Merge multispectral images.

Type

bool

name

Task name.

Type

str

path

Path to output file.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

update_gps_tags

Update GPS tags.

Type

bool

use_initial_calibration

Transform to initial calibration.

Type

bool

workitem_count

Work item count.

Type

int

class DecimateModel

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

apply_to_selection

Apply to selection.

Type

bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

face_count

Target face count.

Type

int

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

model

Model to process.

Type

int

name

Task name.

Type

str

replace_asset

Replace source model with decimated model.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class DetectFiducials

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type
list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fiducials_position_corners

Search corners for fiducials.

Type
bool

fiducials_position_sides

Search sides for fiducials.

Type
bool

frame_detector

Detect frame.

Type
bool

frames

List of frames to process.

Type
list[int]

generate_masks

Generate background masks.

Type
bool

generic_detector

Use generic detector.

Type

bool

gpu_support

GPU support flag.

Type

bool

mask_dark_pixels

Mask out dark pixels near frame edge.

Type

bool

name

Task name.

Type

str

right_angle_detector

Use right angle detector.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

v_shape_detector

Detect V-shape fiducials.

Type

bool

workitem_count

Work item count.

Type

int

class DetectMarkers

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filter_mask

Ignore masked image regions.

Type

bool

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

inverted

Detect markers on black background.

Type

bool

maximum_residual

Maximum residual for non-coded targets in pixels.

Type

float

merge_markers

Merge detected targets with existing markers.

Type

bool

minimum_dist

Minimum distance between targets in pixels (CrossTarget type only).

Type

int

minimum_size

Minimum target radius in pixels to be detected (CrossTarget type only).

Type

int

name

Task name.

Type
str

noparity

Disable parity checking.

Type
bool

target

Task target.

Type
Metashape.Tasks.TargetType

target_type

Type of targets.

Type
Metashape.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

tolerance

Detector tolerance (0 - 100).

Type
int

workitem_count

Work item count.

Type
int

class DetectPowerlines

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

max_quantization_error

Maximum allowed distance between polyline and smooth continuous curve.

Type

float

min_altitude

Minimum altitude for reconstructed powerlines.

Type

float

n_points_per_line

Maximum number of vertices per detected line.

Type

int

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

use_model

Use model for visibility checks.

Type

bool

workitem_count

Work item count.

Type

int

class DuplicateAsset

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.

- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

asset_key

Asset key.

Type
int

asset_type

Asset type.

Type
Metashape.DataSource

clip_to_boundary

Clip to boundary shapes.

Type
bool

clip_to_region

Clip to chunk region.

Type
bool

copy_orthophotos

Copy orthophotos (orthomosaic asset type only).

Type
bool

copy_patches

Copy patches.

Type
bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask**([*objects*])Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class DuplicateChunk

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

cameras

List of camera keys to copy.

Type

list[int]

chunk

Chunk to copy.

Type

int

copy_depth_maps

Copy depth maps.

Type

bool

copy_elevations

Copy DEMs.

Type

bool

copy_keypoints

Copy keypoints.

Type

bool

copy_laser_scans

Copy laser scans.

Type

bool

copy_masks

Copy masks.

Type

bool

copy_models

Copy models.

Type

bool

copy_orthomosaics

Copy orthomosaics.

Type

bool

copy_point_clouds

Copy point clouds.

Type

bool

copy_tiled_models

Copy tiled models.

Type

bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frame keys to copy.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

label

New chunk label.

Type

str

laser_scans

List of laser scan keys to copy.

Type

list[int]

name

Task name.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ExportCameras

Task class containing processing parameters.

apply(*object [, workitem] [, progress]*)

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

binary

Enables/disables binary encoding for selected format (Colmap and FBX formats only).

Type
bool

bingo_path_geoin

Path to BINGO GEO INPUT file.

Type
str

bingo_path_gps

Path to BINGO GPS/IMU file.

Type
str

bingo_path_image

Path to BINGO IMAGE COORDINATE file.

Type
str

bingo_path_itera

Path to BINGO ITERA file.

Type
str

bingo_save_geoin

Enables/disables export of BINGO GEO INPUT file.

Type

bool

bingo_save_gps

Enables/disables export of BINGO GPS/IMU data.

Type

bool

bingo_save_image

Enables/disables export of BINGO IMAGE COORDINATE file.

Type

bool

bingo_save_itera

Enables/disables export of BINGO ITERA file.

Type

bool

bundler_path_list

Path to Bundler image list file.

Type

str

bundler_save_list

Enables/disables export of Bundler image list file.

Type

bool

cameras

List of cameras to export (except AgisoftXML format).

Type

list[int]

chan_rotation_order

Rotation order (CHAN format only).

Type*Metashape.RotationOrder***convert_to_pinhole**

Transform images to pinhole model without distortions.

Type

bool

crs

Output coordinate system (except AgisoftXML format).

Type*Metashape.CoordinateSystem***decode(dict)**

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Export format.

Type

Metashape.CamerasFormat

gpu_support

GPU support flag.

Type

bool

image_compression

Image compression parameters.

Type

Metashape.ImageCompression

image_orientation

Image coordinate system (0 - X right, 1 - X up, 2 - X left, 3 - X down).

Type

int

image_path

Image name template

Type

str

name

Task name.

Type

str

path

Path to output file.

Type

str

save_absolute_paths

Save absolute image paths (BlocksExchange and RZML formats only).

Type

bool

save_images

Enables/disables images export (Colmap format only).

Type

bool

save_invalid_matches

Enables/disables export of invalid image matches.

Type

bool

save_markers

Enables/disables export of manual matching points.

Type

bool

save_masks

Enables/disables image masks export (Colmap format only).

Type

bool

save_points

Enables/disables export of automatic tie points.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

use_initial_calibration

Transform image coordinates to initial calibration.

Type

bool

use_labels

Enables/disables label based item identifiers.

Type

bool

workitem_count

Work item count.

Type

int

class ExportMarkers

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

binary

Enables/disables binary encoding for selected format (if applicable).

Type

bool

crs

Output coordinate system.

Type

Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Path to output file.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ExportMasks

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type
list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

masks

Masks key to export.

Type
int

name

Task name.

Type
str

path

Path to output file.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ExportModel

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (`Metashape.Chunk` / `Metashape.Document`) – Chunk or Document object to be processed.
- **workitem** (`int`) – Workitem index.
- **progress** (`Callable[[float], None]`) – Progress callback.

binary

Enables/disables binary encoding (if supported by format).

Type

bool

block_margin

Block margin (m).

Type

float

clip_to_block

Clip model to block region.

Type

bool

clip_to_boundary

Clip model to boundary shapes.

Type

bool

clip_to_region

Clip model to chunk region.

Type

bool

colors_rgb_8bit

Convert colors to 8 bit RGB.

Type

bool

comment

Optional comment (if supported by selected format).

Type

str

crs

Output coordinate system.

Type

Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

embed_texture

Embeds texture inside the model file (if supported by format).

Type

bool

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Export format.

Type

Metashape.ModelFormat

gltf_y_up

Enables/disables y-up axes notation used in glTF.

Type

bool

gpu_support

GPU support flag.

Type

bool

model

Model key to export.

Type

int

name

Task name.

Type

str

path

Path to output model.

Type

str

precision

Number of digits after the decimal point (for text formats).

Type

int

raster_transform

Raster band transformation.

Type

Metashape.RasterTransformType

save_alpha

Enables/disables alpha channel export.

Type

bool

save_cameras

Enables/disables camera export.

Type

bool

save_colors

Enables/disables export of vertex colors.

Type

bool

save_comment

Enables/disables comment export.

Type

bool

save_confidence

Enables/disables export of vertex confidence.

Type

bool

save_markers

Enables/disables marker export.

Type

bool

save_metadata_xml

Save metadata.xml file.

Type

bool

save_normals

Enables/disables export of vertex normals.

Type

bool

save_texture

Enables/disables texture export.

Type

bool

save_udim

Enables/disables UDIM texture layout.

Type

bool

save_uv

Enables/disables uv coordinates export.

Type

bool

shift

Optional shift to be applied to vertex coordinates.

Type

Metashape.Vector

strip_extensions

Strips camera label extensions during export.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

texture_format

Texture format.

Type

Metashape.ImageFormat

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

viewpoint

Default view.

Type

Metashape.Viewpoint

workitem_count

Work item count.

Type

int

class ExportOrthophotos

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

image_compression

Image compression parameters.

Type

Metashape.ImageCompression

name

Task name.

Type

str

north_up

Use north-up orientation for export.

Type

bool

path

Path to output orthophoto.

Type

str

projection

Output projection.

Type

Metashape.OrthoProjection

raster_transform

Raster band transformation.

Type

Metashape.RasterTransformType

region

Region to be exported.

Type

Metashape.BBox

resolution

Output resolution in meters.

Type

float

resolution_x

Pixel size in the X dimension in projected units.

Type

float

resolution_y

Pixel size in the Y dimension in projected units.

Type

float

save_alpha

Enable alpha channel generation.

Type

bool

save_kml

Enable kml file generation.

Type

bool

save_world

Enable world file generation.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

white_background

Enable white background.

Type

bool

workitem_count

Work item count.

Type

int

class ExportPointCloud

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

binary

Enables/disables binary encoding for selected format (if applicable).

Type

bool

block_height

Block height in meters.

Type

float

block_width

Block width in meters.

Type

float

classes

List of point classes to be exported.

Type

list[int]

clip_to_boundary

Clip point cloud to boundary shapes.

Type

bool

clip_to_region

Clip point cloud to chunk region.

Type

bool

colors_rgb_8bit

Convert colors to 8 bit RGB.

Type

bool

comment

Optional comment (if supported by selected format).

Type

str

compression

Enable compression (Cesium format only).

Type

bool

crs

Output coordinate system.

Type

Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

folder_depth

Tileset subdivision depth (Cesium format only).

Type

int

format

Export format.

Type

Metashape.PointCloudFormat

gpu_support

GPU support flag.

Type
bool**image_format**

Image data format.

Type
*Metashape.ImageFormat***name**

Task name.

Type
str**path**

Path to output file.

Type
str**point_clouds**

Point cloud keys to export.

Type
list[int]**raster_transform**

Raster band transformation.

Type
*Metashape.RasterTransformType***region**

Region to be exported.

Type
*Metashape.BBox***save_comment**

Enable comment export.

Type
bool**save_images**

Enable image export.

Type
bool**save_point_classification**

Enables/disables export of point classification.

Type
bool**save_point_color**

Enables/disables export of point color.

Type
bool

save_point_confidence

Enables/disables export of point confidence.

Type

bool

save_point_index

Enables/disables export of point row and column indices.

Type

bool

save_point_intensity

Enables/disables export of point intensity.

Type

bool

save_point_normal

Enables/disables export of point normal.

Type

bool

save_point_return_number

Enables/disables export of point return number.

Type

bool

save_point_scan_angle

Enables/disables export of point scan angle.

Type

bool

save_point_source_id

Enables/disables export of point source ID.

Type

bool

save_point_timestamp

Enables/disables export of point timestamp.

Type

bool

screen_space_error

Target screen space error (Cesium format only).

Type

float

shift

Optional shift to be applied to point coordinates.

Type

Metashape.Vector

source_data

Selects between point cloud and tie points. If not specified, uses point cloud if available.

Type

Metashape.DataSource

split_in_blocks

Enable tiled export.

Type

bool

subdivide_task

Enable fine-level task subdivision.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

tileset_version

Cesium 3D Tiles format version to export (1.0 or 1.1).

Type

str

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

viewpoint

Default view.

Type

Metashape.Viewpoint

workitem_count

Work item count.

Type

int

class ExportRaster

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

asset

Asset key to export.

Type

int

block_height

Raster block height in pixels.

Type

int

block_width

Raster block width in pixels.

Type
int

clip_to_boundary

Clip raster to boundary shapes.

Type
bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

description

Export description.

Type
str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Export format.

Type
Metashape.RasterFormat

global_profile

Use global profile (GeoPackage and TMS formats only).

Type
bool

gpu_support

GPU support flag.

Type
bool

height

Raster height.

Type
int

image_compression

Image compression parameters.

Type
Metashape.ImageCompression

image_description

Optional description to be added to image files.

Type
str

image_format

Tile format.

Type

Metashape.ImageFormat

max_zoom_level

Maximum zoom level (GeoPackage, Google Map Tiles, MBTiles and World Wind Tiles formats only).

Type

int

min_zoom_level

Minimum zoom level (GeoPackage, Google Map Tiles, MBTiles and World Wind Tiles formats only).

Type

int

name

Task name.

Type

str

network_links

Enable network links generation for KMZ format.

Type

bool

nodata_value

No-data value (DEM export only).

Type

float

north_up

Use north-up orientation for export.

Type

bool

path

Path to output orthomosaic.

Type

str

projection

Output projection.

Type

Metashape.OrthoProjection

raster_transform

Raster band transformation.

Type

Metashape.RasterTransformType

region

Region to be exported.

Type

Metashape.BBox

resolution

Output resolution in meters.

Type

float

resolution_x

Pixel size in the X dimension in projected units.

Type

float

resolution_y

Pixel size in the Y dimension in projected units.

Type

float

save_alpha

Enable alpha channel generation.

Type

bool

save_kml

Enable kml file generation.

Type

bool

save_scheme

Enable tile scheme files generation.

Type

bool

save_world

Enable world file generation.

Type

bool

source_data

Selects between DEM and orthomosaic.

Type

Metashape.DataSource

split_in_blocks

Split raster in blocks.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

tile_height

Tile height in pixels.

Type

int

tile_width

Tile width in pixels.

Type
int

title

Export title.

Type
str

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

white_background

Enable white background.

Type
bool

width

Raster width.

Type
int

workitem_count

Work item count.

Type
int

world_transform

2x3 raster-to-world transformation matrix.

Type
Metashape.Matrix

class ExportReference

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

columns

Column order in CSV format (n - label, o - enabled flag, x/y/z - coordinates, X/Y/Z - coordinate accuracy, a/b/c - rotation angles, A/B/C - rotation angle accuracy, u/v/w - estimated coordinates, U/V/W - coordinate errors, d/e/f - estimated orientation angles, D/E/F - orientation errors, p/q/r - estimated coordinates variance, i/j/k - estimated orientation angles variance, [] - group of multiple values, | - column separator within group).

Type
str

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

delimiter

Column delimiter (CSV format only).

Type

str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Export format.

Type

Metashape.ReferenceFormat

gpu_support

GPU support flag.

Type

bool

items

Items to export (CSV format only).

Type

Metashape.ReferenceItems

name

Task name.

Type

str

path

Path to the output file.

Type

str

precision

Number of digits after the decimal point (CSV format only).

Type

int

save_enabled

Save enabled flag (CSV format only).

Type

bool

save_errors

Save errors (CSV format only).

Type

bool

save_estimated

Save estimated values (CSV format only).

Type

bool

save_location_accuracy

Save location accuracy (CSV format only).

Type

bool

save_rotation

Save rotation angles (CSV format only).

Type

bool

save_rotation_accuracy

Save rotation accuracy (CSV format only).

Type

bool

save_variance

Save variance (CSV format only).

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ExportReport

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

description

Report description.

Type

str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

font_size

Font size (pt).

Type

int

gpu_support

GPU support flag.

Type

bool

include_system_info

Include system information.

Type

bool

logo_path

Path to company logo file.

Type

str

name

Task name.

Type

str

page_numbers

Enable page numbers.

Type

bool

path

Path to output report.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

title

Report title.

Type
str

toNetworkTask(*objects*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

user_settings

A list of user defined settings to include on the Processing Parameters page.

Type
list[tuple[str, str]]

workitem_count

Work item count.

Type
int

class ExportShapes

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

crs

Output coordinate system.

Type
Metashape.CoordinateSystem

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Export format.

Type
Metashape.ShapesFormat

gpu_support

GPU support flag.

Type
bool

groups

A list of shape groups to export.

Type

list[int]

name

Task name.

Type

str

path

Path to shape file.

Type

str

polygons_as_polylines

Save polygons as polylines.

Type

bool

save_attributes

Export attributes.

Type

bool

save_elevation

Export elevation values for 3D shapes.

Type

bool

save_labels

Export labels.

Type

bool

save_points

Export points.

Type

bool

save_polygons

Export polygons.

Type

bool

save_polylines

Export polylines.

Type

bool

shift

Optional shift to be applied to vertex coordinates.

Type

Metashape.Vector

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ExportTexture

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Path to output file.

Type

str

raster_transform

Raster band transformation.

Type*Metashape.RasterTransformType***save_alpha**

Enable alpha channel export.

Type

bool

target

Task target.

Type*Metashape.Tasks.TargetType***texture_type**

Texture type.

Type*Metashape.Model.TextureType***toNetworkTask**([*objects*])Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class ExportTiledModel

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

clip_to_boundary

Clip tiled model to boundary shapes.

Type

bool

clip_to_region

Clip tiled model to chunk region.

Type

bool

crs

Output coordinate system.

Type*Metashape.CoordinateSystem***decode**(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

face_count

Number of faces per megapixel of texture resolution (block model export only).

Type

int

folder_depth

Tileset subdivision depth (Cesium format only).

Type

int

format

Export format.

Type

Metashape.TiledModelFormat

gpu_support

GPU support flag.

Type

bool

image_compression

Image compression parameters.

Type

Metashape.ImageCompression

model_compression

Enable mesh compression (Cesium format only).

Type

bool

model_format

Model format for zip export.

Type

Metashape.ModelFormat

model_group

Block model key to export.

Type

int

name

Task name.

Type

str

path

Path to output model.

Type
str

pixel_size

Target model resolution in meters (block model export only).

Type
float

raster_transform

Raster band transformation.

Type
Metashape.RasterTransformType

screen_space_error

Target screen space error (Cesium format only).

Type
float

target

Task target.

Type
Metashape.Tasks.TargetType

texture_format

Texture format.

Type
Metashape.ImageFormat

tile_size

Size of tiles in pixels (block model export only).

Type
int

tiled_model

Tiled model key to export.

Type
int

tileset_version

Cesium 3D Tiles format version to export (1.0 or 1.1).

Type
str

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

use_tileset_transform

Use tileset transform instead of individual tile transforms (Cesium format only).

Type
bool

workitem_count

Work item count.

Type
int

zip_compression

Enable zip compression (Cesium format only).

Type
bool

class FilterPointCloud

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

clip_to_region

Clip point cloud to chunk region.

Type
bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type
list[int]

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

point_cloud

Point cloud key to filter.

Type
int

point_spacing

Desired point spacing (m).

Type

float

replace_asset

Replace default asset with filtered point cloud.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class GenerateMasks

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

blur_threshold

Allowed blur radius on a photo in pix (only if *mask_defocus=True*).

Type

float

cameras

Optional list of cameras to be processed.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

depth_threshold

Maximum depth of masked areas in meters (only if *mask_defocus=False*).

Type

float

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fix_coverage

Extend masks to cover whole mesh (only if mask_defocus=True).

Type

bool

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

mask_defocus

Mask defocus areas.

Type

bool

mask_operation

Mask operation.

Type

Metashape.MaskOperation

masking_mode

Mask generation mode.

Type

Metashape.MaskingMode

name

Task name.

Type

str

path

Mask file name template.

Type

str

replace_asset

Update default set of masks with generated masks.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

tolerance

Background masking tolerance.

Type

int

workitem_count

Work item count.

Type

int

class GeneratePrescriptionMap

Task class containing processing parameters.

apply(*object[, workitem][, progress]*)

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

boundary_shape_group

Boundary shape group.

Type

int

breakpoints

Classification breakpoints.

Type

list[float]

cell_size

Step of prescription grid, meters.

Type

float

class_count

Number of classes.

Type

int

classification_method

Index values classification method.

Type

Metashape.ClassificationMethod

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

rates

Fertilizer rate for each class.

Type

list[float]

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / list[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ImportCameras

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

crs

Ground coordinate system.

Type

Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

File format.

Type

Metashape.CamerasFormat

gpu_support

GPU support flag.

Type

bool

image_list

Path to image list file (Bundler format only).

Type

str

image_orientation

Image coordinate system (0 - X right, 1 - X up, 2 - X left, 3 - X down).

Type

int

load_image_list

Enable Bundler image list import.

Type

bool

name

Task name.

Type

str

path

Path to the file.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ImportDepthImages

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

color_filenames

List of corresponding color files, if present.

Type
list[str]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filenames

List of files to import. Either smartphone depth photos or depth images with corresponding color images in *color_filenames* parameter.

Type
list[str]

format

Point cloud format.

Type
Metashape.PointCloudFormat

gpu_support

GPU support flag.

Type
bool

image_path

Path template to output pre-processed files.

Type
str

multiplane

Import as a multi-camera system

Type

bool

name

Task name.

Type

str

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask**(*[objects]*)Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class ImportMarkers

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Path to the file.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ImportModel

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

crs

Model coordinate system.

Type
Metashape.CoordinateSystem

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

decode_udim

Load UDIM texture layout.

Type
bool

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Model format.

Type*Metashape.ModelFormat***frame_paths**

List of model paths to import in each frame of a multiframe chunk.

Type

list[str]

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Path to model.

Type

str

replace_asset

Replace default asset with imported model.

Type

bool

shift

Optional shift to be applied to vertex coordinates.

Type*Metashape.Vector***target**

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class ImportPointCloud

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.

- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

calculate_normals

Calculate point normals.

Type

bool

columns

Column order (x/y/z - coordinates, X/Y/Z - normal, r/g/b - color, i - intensity, t - time, c - classification, space - skip column).

Type

str

crs

Point cloud coordinate system.

Type

Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

delimiter

CSV delimiter.

Type

str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Point cloud format.

Type

Metashape.PointCloudFormat

frame_paths

List of point cloud paths to import in each frame of a multiframe chunk.

Type

list[str]

generate_panorama

Generate panorama from point colors.

Type

bool

gpu_support

GPU support flag.

Type

bool

group_delimiters

Combine consecutive delimiters in csv format.

Type

bool

ignore_scanner_origin

Do not use laser scan origin as scanner position for structured point clouds.

Type

bool

ignore_trajectory

Do not attach trajectory to imported point cloud.

Type

bool

is_laser_scan

Import point clouds as laser scans.

Type

bool

load_images

Import images embedded in laser scan.

Type

bool

load_point_classification

Import point classification.

Type

bool

load_point_color

Import point color.

Type

bool

load_point_confidence

Import point confidence.

Type

bool

load_point_index

Import point row and column indices.

Type

bool

load_point_intensity

Import point intensity.

Type

bool

load_point_normal

Import point normal.

Type

bool

load_point_return_number

Import point return number.

Type

bool

load_point_scan_angle

Import point scan angle.

Type

bool

load_point_source_id

Import point source ID.

Type

bool

load_point_timestamp

Import point timestamp.

Type

bool

name

Task name.

Type

str

path

Path to point cloud.

Type

str

point_neighbors

Number of point neighbors to use for normal estimation.

Type

int

precision

Coordinate precision (m). For default precision use 0.

Type

float

replace_asset

Replace default asset with imported point cloud.

Type

bool

scanner_at_origin

Use laser scan origin as scanner position for unstructured point clouds.

Type

bool

shift

Optional shift to be applied to point coordinates.

Type

Metashape.Vector

skip_rows

Number of rows to skip.

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

trajectory

Trajectory key to attach.

Type
int

workitem_count

Work item count.

Type
int

class ImportRaster

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

crs

Default coordinate system if not specified in GeoTIFF file.

Type
Metashape.CoordinateSystem

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type
list[int]

gpu_support

GPU support flag.

Type
bool

has_nodata_value

No-data value valid flag.

Type
bool

name

Task name.

Type
str

nodata_value

No-data value.

Type
float

path

Path to elevation model in GeoTIFF format.

Type
str

raster_type

Type of raster layer to import.

Type
Metashape.DataSource

replace_asset

Replace default raster with imported one.

Type
bool

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ImportReference

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

column_a

1st rotation angle column (CSV format only).

Type

int

column_b

2nd rotation angle column (CSV format only).

Type

int

column_c

3rd rotation angle column (CSV format only).

Type

int

column_enabled

Enabled flag column (CSV format only).

Type

int

column_label

Label column (CSV format only).

Type

int

column_sa

1st rotation angle accuracy column (CSV format only).

Type

int

column_sb

2nd rotation angle accuracy column (CSV format only).

Type

int

column_sc

3rd rotation angle accuracy column (CSV format only).

Type

int

column_sx

X coordinate accuracy column (CSV format only).

Type

int

column_sy

Y coordinate accuracy column (CSV format only).

Type

int

column_sz

Z coordinate accuracy column (CSV format only).

Type
int

column_x

X coordinate column (CSV format only).

Type
int

column_y

Y coordinate column (CSV format only).

Type
int

column_z

Z coordinate column (CSV format only).

Type
int

columns

Column order in CSV format (n - label, o - enabled flag, x/y/z - coordinates, X/Y/Z - coordinate accuracy, a/b/c - rotation angles, A/B/C - rotation angle accuracy, [] - group of multiple values, | - column separator within group).

Type
str

create_markers

Create markers for missing entries (CSV format only).

Type
bool

crs

Reference data coordinate system (CSV format only).

Type
Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

delimiter

Column delimiter (CSV format only).

Type
str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

File format.

Type

Metashape.ReferenceFormat

gpu_support

GPU support flag.

Type

bool

group_delimiters

Combine consecutive delimiters (CSV format only).

Type

bool

ignore_labels

Matches reference data based on coordinates alone (CSV format only).

Type

bool

items

Items to load reference for (CSV format only).

Type

Metashape.ReferenceItems

load_enabled

Load enabled flag (CSV format only).

Type

bool

load_location_accuracy

Load location accuracy (CSV format only).

Type

bool

load_rotation

Load rotation angles (CSV format only).

Type

bool

load_rotation_accuracy

Load rotation accuracy (CSV format only).

Type

bool

name

Task name.

Type

str

path

Path to the file with reference data.

Type

str

rotation_angles

Euler angles triplet used for rotation reference (CSV format only).

Type

Metashape.EulerAngles

shutter_lag

Shutter lag in seconds (APM format only).

Type
float

skip_rows

Number of rows to skip (CSV format only).

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

threshold

Error threshold in meters used when ignore_labels is set (CSV format only).

Type
float

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters
objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class ImportShapes

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

boundary_type

Boundary type to be applied to imported shapes.

Type
Metashape.Shape.BoundaryType

columns

Column order in csv format (n - label, x/y/z - coordinates, d - description, [] - group of multiple values, | - column separator within group).

Type
str

crs

Reference data coordinate system (csv format only).

Type
Metashape.CoordinateSystem

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

delimiter

Column delimiter in csv format.

Type
str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Shapes format.

Type
Metashape.ShapesFormat

gpu_support

GPU support flag.

Type
bool

group_delimiters

Combine consecutive delimiters in csv format.

Type
bool

name

Task name.

Type
str

path

Path to shape file.

Type
str

replace

Replace current shapes with new data.

Type
bool

skip_rows

Number of rows to skip in (csv format only).

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ImportTiledModel

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Path to tiled model.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ImportTrajectory

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

columns

Column order in csv format (t - time, x/y/z - coordinates, a/b/c - rotation angles, space - skip column).

Type

str

crs

Point cloud coordinate system.

Type

Metashape.CoordinateSystem

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

delimiter

Column delimiter in csv format.

Type

str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

format

Trajectory format.

Type

Metashape.TrajectoryFormat

gpu_support

GPU support flag.

Type

bool

group_delimiters

Combine consecutive delimiters in csv format.

Type

bool

name

Task name.

Type

str

path

Trajectory file path.

Type

str

replace_asset

Replace default asset with imported trajectory.

Type

bool

shift

Optional shift to be applied to point coordinates.

Type

Metashape.Vector

skip_rows

Number of rows to skip in (csv format only).

Type

int

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class ImportVideo

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

custom_frame_step

Every custom_frame_step`th frame will be saved. Used for frame_step=CustomFrameStep.

Type
int

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frame_step

Frame step type.

Type
Metashape.FrameStep

gpu_support

GPU support flag.

Type
bool

image_path

Path to directory where to save frames with filename template. For example:
/path/to/dir/frame{filenum}.png.

Type
str

name

Task name.

Type
str

path

Path to source video.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

time_end

The endpoint for importing video, seconds.

Type
float

time_start

The starting point for importing video, seconds.

Type
float

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class InvertMasks

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (`Metashape.Document` / `Metashape.Chunk` / `list[Metashape.Chunk]`) – Objects to be processed.

workitem_count

Work item count.

Type

int

class LoadProject

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (`Metashape.Chunk` / `Metashape.Document`) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (`Callable[[float], None]`) – Progress callback.

archive

Override project format when using non-standard file extension.

Type

bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Path to project file.

Type

str

read_only

Open project in read only mode.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class MatchPhotos

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to match.

Type

list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

downscale

Image alignment accuracy (0 - Highest, 1 - High, 2 - Medium, 4 - Low, 8 - Lowest).

Type

int

downscale_3d

Laser scan alignment accuracy (1 - Highest, 2 - High, 4 - Medium, 8 - Low, 16 - Lowest).

Type

int

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

filter_mask

Filter points by mask.

Type

bool

filter_stationary_points

Exclude tie points which are stationary across images.

Type

bool

generic_preselection

Enable generic preselection.

Type

bool

gpu_support

GPU support flag.

Type

bool

guided_matching

Enable guided image matching.

Type

bool

keep_keypoints

Store keypoints in the project.

Type

bool

keypoint_limit

Key point limit.

Type

int

keypoint_limit_3d

Key point limit for laser scans.

Type

int

keypoint_limit_per_mpx

Key point limit per megapixel.

Type

int

laser_scans_use_initial_orientation

Use initial laser scan orientation for keypoint matching.

Type

bool

laser_scans_vertical_axis

Common laser scans axis.

Type

int

mask_tiepoints

Apply mask filter to tie points.

Type

bool

match_laser_scans

Match laser scans using geometric features.

Type

bool

max_workgroup_size

Maximum workgroup size.

Type

int

name

Task name.

Type

str

pairs

User defined list of camera pairs to match.

Type

list[tuple[int, int]]

reference_preselection

Enable reference preselection.

Type

bool

reference_preselection_mode

Reference preselection mode.

Type

Metashape.ReferencePreselectionMode

reset_matches

Reset current matches.

Type

bool

subdivide_task

Enable fine-level task subdivision.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

tiepoint_limit

Tie point limit.

Type

int

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

workitem_size_cameras

Number of cameras in a workitem.

Type
int

workitem_size_pairs

Number of image pairs in a workitem.

Type
int

class MergeAssets

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

apply_boresight_offset

Apply boresight offset when merging point clouds.

Type
bool

apply_trajectory_mask

Apply trajectory mask when merging point clouds.

Type
bool

assets

List of assets to process.

Type
list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

merge_orthophotos

Merge orthophotos when merging orthomosaics.

Type

bool

name

Task name.

Type

str

source_data

Asset type.

Type

Metashape.DataSource

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class MergeChunks

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

chunks

List of chunks to process.

Type

list[int]

copy_depth_maps

Copy depth maps.

Type

bool

copy_elevations

Copy DEMs.

Type

bool

copy_laser_scans

Copy laser scans.

Type

bool

copy_masks

Copy masks.

Type

bool

copy_models

Copy models.

Type

bool

copy_orthomosaics

Copy orthomosaics.

Type

bool

copy_point_clouds

Copy point clouds.

Type

bool

copy_tiled_models

Copy tiled models.

Type

bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

merge_assets

Merge default assets.

Type

bool

merge_markers

Merge markers.

Type

bool

merge_tiepoints

Merge tie points.

Type

bool

name

Task name.

Type

str

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class OptimizeCameras

Task class containing processing parameters.

adaptive_fitting

Enable adaptive fitting of distortion coefficients.

Type

bool

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fit_b1

Enable optimization of aspect ratio.

Type

bool

fit_b2

Enable optimization of skew coefficient.

Type

bool

fit_corrections

Enable optimization of additional corrections.

Type

bool

fit_cx

Enable optimization of X principal point coordinates.

Type

bool

fit_cy

Enable optimization of Y principal point coordinates.

Type

bool

fit_f

Enable optimization of focal length coefficient.

Type

bool

fit_k1

Enable optimization of k1 radial distortion coefficient.

Type

bool

fit_k2

Enable optimization of k2 radial distortion coefficient.

Type

bool

fit_k3

Enable optimization of k3 radial distortion coefficient.

Type

bool

fit_k4

Enable optimization of k3 radial distortion coefficient.

Type

bool

fit_p1

Enable optimization of p1 tangential distortion coefficient.

Type

bool

fit_p2

Enable optimization of p2 tangential distortion coefficient.

Type

bool

gpu_support

GPU support flag.

Type
bool**name**

Task name.

Type
str**target**

Task target.

Type
*Metashape.Tasks.TargetType***tiepoint_covariance**

Estimate tie point covariance matrices.

Type
bool**toNetworkTask**(*[objects]*)Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type
int**class PansharpenOrthomosaic**

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

channels

Orthomosaic channel mask (boolean flags, e.g. 0b0010 means only 1st channel is used and the rest ignored).

Type
int**clip_to_pan_data**

Clip result to high resolution orthomosaic.

Type
bool**decode**(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

orthomosaic

Orthomosaic to pansharpener.

Type

int

pan_channels

Detailed orthomosaic channel mask (boolean flags, e.g. 0b0010 means only 1st channel is used and the rest ignored).

Type

int

pan_orthomosaic

Detailed orthomosaic.

Type

int

replace_asset

Replace source orthomosaic with pansharpenered result.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class PlanMission

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

attach_viewpoints

Generate additional viewpoints to increase coverage.

Type
bool

capture_distance

Image capture distance (m).

Type
float

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

group_attached_viewpoints

Ignore minimum waypoint spacing for additional viewpoints.

Type
bool

home_point

Home point shape key.

Type
int

horizontal_zigzags

Cover surface with horizontal zigzags instead of vertical.

Type
bool

interesting_zone

Interesting zone shape layer key.

Type
int

max_pitch

Maximum camera pitch angle.

Type
int

min_altitude

Minimum altitude (m).

Type
float

min_pitch

Minimum camera pitch angle.

Type
int

min_waypoint_spacing

Minimum waypoint spacing (m).

Type
float

name

Task name.

Type
str

overlap

Overlap percent.

Type
int

powerlines

Powerlines shape layer key.

Type
int

restricted_zone

Restricted zone shape layer key.

Type
int

safety_distance

Safety distance (m).

Type
float

safety_zone

Safety zone shape layer key.

Type
int

sensor

Sensor key.

Type
int

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

use_selection

Focus on model selection.

Type
bool

workitem_count

Work item count.

Type
int

class PublishData

Task class containing processing parameters.

account

Account name (Nira (Key ID) service).

Type
str

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

description

Dataset description.

Type
str

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

hostname

Service hostname (4DMapper and Nira services).

Type

str

image_compression

Image compression parameters.

Type

Metashape.ImageCompression

is_draft

Mark dataset as draft (Sketchfab service).

Type

bool

is_private

Set dataset access to private (Pointbox and Sketchfab services).

Type

bool

is_protected

Set dataset access to protected (Pointbox service).

Type

bool

max_zoom_level

Maximum zoom level.

Type

int

min_zoom_level

Minimum zoom level.

Type

int

name

Task name.

Type

str

owner

Account owner (Cesium and Mapbox services).

Type

str

password

Account password (4DMapper, Agisoft Cloud, Pointscene and Sketchfab services).

Type

str

point_classes

List of point classes to be exported.

Type
list[int]

project_id

Id of a target project (from Agisoft Cloud project URL).

Type
str

projection

Output projection.

Type
Metashape.CoordinateSystem

raster_transform

Raster band transformation.

Type
Metashape.RasterTransformType

resolution

Output resolution in meters.

Type
float

save_camera_track

Enables/disables export of camera track.

Type
bool

save_point_color

Enables/disables export of point colors.

Type
bool

service

Service to upload on.

Type
Metashape.ServiceType

source_data

Asset type to upload.

Type
Metashape.DataSource

tags

Dataset tags.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

tile_size

Tile size in pixels.

Type
int

title

Dataset title.

Type
str

toNetworkTask(*[objects]*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

token

Account token (Cesium, Mapbox, Nira (Key Secret), Picterra, Pointbox and Sketchfab services).

Type
str

upload_images

Attach photos to Nira publication.

Type
bool

username

Account username (4DMapper, Agisoft Cloud and Pointscene services).

Type
str

workitem_count

Work item count.

Type
int

class ReduceOverlap

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

overlap

Target number of cameras observing each point of the surface.

Type

int

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

use_selection

Focus on model selection.

Type

bool

workitem_count

Work item count.

Type

int

class RefineModel

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

downscale

Refinement quality (1 - Ultra high, 2 - High, 4 - Medium, 8 - Low, 16 - Lowest).

Type

int

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

iterations

Number of refinement iterations.

Type

int

model

Model to process.

Type

int

name

Task name.

Type

str

replace_asset

Replace default asset with refined model.

Type

bool

smoothness

Smoothing strength. Should be in range [0, 1].

Type

float

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask(*objects*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type

int

class RemoveLighting

Task class containing processing parameters.

ambient_occlusion_multiplier

Ambient occlusion multiplier. Should be in range [0.25, 4].

Type

float

ambient_occlusion_path

Path to ambient occlusion texture atlas. Can be empty.

Type

str

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

color_mode

Enable multi-color processing mode.

Type

bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

internal_blur

Internal blur. Should be in range [0, 4].

Type

float

mesh_noise_suppression

Mesh normals noise suppression strength. Should be in range [0, 4].

Type

float

name

Task name.

Type

str

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class RenderDepthMaps

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool**name**

Task name.

Type
str**path_depth**

Path to depth map.

Type
str**path_diffuse**

Path to diffuse map.

Type
str**path_normals**

Path to normal map.

Type
str**save_depth**

Enable export of depth map.

Type
bool**save_diffuse**

Enable export of diffuse map.

Type
bool**save_normals**

Enable export of normal map.

Type
bool**target**

Task target.

Type
*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type
int

class ResetMasks

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

cameras

List of cameras to process.

Type

list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / list[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type

int

class RunScript

Task class containing processing parameters.

apply(*object*[, *workitem*][, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

args

Script arguments.

Type

str

code

Script code.

Type

str

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

path

Script path.

Type

str

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([*objects*])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

- **objects** (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.

workitem_count

Work item count.

Type
int

class SaveProject

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

archive

Override project format when using non-standard file extension.

Type
bool

chunks

List of chunks to be saved.

Type
list[int]

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type
bool

name

Task name.

Type
str

path

Path to project.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask(*objects*)

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

version

Project version to save.

Type

str

workitem_count

Work item count.

Type

int

class SmoothModel

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

apply_to_selection

Apply to selected faces.

Type

bool

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

fix_borders

Fix borders.

Type

bool

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

model

Key of model to smooth.

Type

int

name

Task name.

Type

str

preserve_edges

Preserve edges.

Type

bool

replace_asset

Replace default asset with smoothed model.

Type

bool

strength

Smoothing strength.

Type

float

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask([objects])**Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class SmoothPointCloud

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

apply_to_selection

Smooth points within selection.

Type

bool

classes

List of point classes to be smoothed.

Type

list[int]

clip_to_region

Clip point cloud to chunk region.

Type

bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

name

Task name.

Type

str

point_cloud

Key of point cloud to filter.

Type

int

replace_asset

Replace default asset with smoothed point cloud.

Type

bool

smoothing_radius

Desired smoothing radius (m).

Type

float

target

Task target.

Type*Metashape.Tasks.TargetType***toNetworkTask**([*objects*])Convert task to *Metashape.NetworkTask* to be applied to specified objects.**Parameters****objects** (*Metashape.Document* / *Metashape.Chunk* / *list*[*Metashape.Chunk*]) – Objects to be processed.**workitem_count**

Work item count.

Type

int

class TargetType

Task target type in [DocumentTarget, ChunkTarget, FrameTarget]

class TrackMarkers

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

first_frame

Starting frame index.

Type

int

gpu_support

GPU support flag.

Type

bool

last_frame

Ending frame index.

Type

int

name

Task name.

Type
str

target

Task target.

Type
Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

workitem_count

Work item count.

Type
int

class TransformRaster

Task class containing processing parameters.

apply(object[, workitem][, progress])

Apply task to specified object.

Parameters

- **object** (*Metashape.Chunk* / *Metashape.Document*) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable[[float], None]*) – Progress callback.

asset

Asset key to transform.

Type
int

clip_to_boundary

Clip raster to boundary shapes.

Type
bool

copy_orthophotos

Copy orthophotos (orthomosaic asset type only).

Type
bool

decode(dict)

Initialize task parameters with a dictionary.

decodeJSON(json)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

frames

List of frames to process.

Type

list[int]

gpu_support

GPU support flag.

Type

bool

height

Raster height.

Type

int

name

Task name.

Type

str

nodata_value

No-data value (DEM export only).

Type

float

north_up

Use north-up orientation for export.

Type

bool

operand_asset

Operand asset key.

Type

int

operand_chunk

Operand chunk key.

Type

int

operand_frame

Operand frame key.

Type

int

projection

Output projection.

Type

Metashape.OrthoProjection

region

Region to be processed.

Type

Metashape.BBox

replace_asset

Replace default raster with transformed one.

Type

bool

resolution

Output resolution in meters.

Type

float

resolution_x

Pixel size in the X dimension in projected units.

Type

float

resolution_y

Pixel size in the Y dimension in projected units.

Type

float

source_data

Selects between DEM and orthomosaic.

Type

Metashape.DataSource

subtract

Subtraction flag.

Type

bool

target

Task target.

Type

Metashape.Tasks.TargetType

toNetworkTask([objects])

Convert task to *Metashape.NetworkTask* to be applied to specified objects.

Parameters

objects (*Metashape.Document* / *Metashape.Chunk* / *list[Metashape.Chunk]*) – Objects to be processed.

width

Raster width.

Type

int

workitem_count

Work item count.

Type

int

world_transform

2x3 raster-to-world transformation matrix.

Type

Metashape.Matrix

class TriangulateTiePoints

Task class containing processing parameters.

apply(*object* [, *workitem*] [, *progress*])

Apply task to specified object.

Parameters

- **object** ([Metashape.Chunk](#) / [Metashape.Document](#)) – Chunk or Document object to be processed.
- **workitem** (*int*) – Workitem index.
- **progress** (*Callable*[[*float*], *None*]) – Progress callback.

decode(*dict*)

Initialize task parameters with a dictionary.

decodeJSON(*json*)

Initialize task parameters from a JSON string.

encode()

Create a dictionary with task parameters.

encodeJSON()

Create a JSON string with task parameters.

gpu_support

GPU support flag.

Type

bool

max_error

Reprojection error threshold.

Type

float

min_image

Minimum number of point projections.

Type

int

name

Task name.

Type

str

target

Task target.

Type

[Metashape.Tasks.TargetType](#)

toNetworkTask([*objects*])

Convert task to [Metashape.NetworkTask](#) to be applied to specified objects.

Parameters

- **objects** ([Metashape.Document](#) / [Metashape.Chunk](#) / *list*[[Metashape.Chunk](#)]) – Objects to be processed.

workitem_count

Work item count.

Type
int

createTask(*name*)

Create task object by its name.

Parameters

name (*str*) – Task name.

Returns

Task object.

Return type

object

class Metashape.**Thumbnail**

Thumbnail instance

copy()

Returns a copy of thumbnail.

Returns

Copy of thumbnail.

Return type

Metashape.Thumbnail

image()

Returns image data.

Returns

Image data.

Return type

Metashape.Image

load(*path*[, *layer*])

Loads thumbnail from file.

Parameters

- **path** (*str*) – Path to the image file to be loaded.
- **layer** (*int*) – Optional layer index in case of multipage files.

setImage(*image*)

Parameters

image (*Metashape.Image*) – Image object with thumbnail data.

class Metashape.**Thumbnails**

A set of thumbnails generated for a chunk frame.

items()

List of items.

keys()

List of item keys.

meta

Thumbnails meta data.

Type*Metashape.MetaData***modified**

Modified flag.

Type

bool

values()

List of item values.

class Metashape.TiePoints

Tie point cloud instance

class CamerasCollection of *Metashape.TiePoints.Projections* objects indexed by corresponding cameras**class Criterion**

Tie points filter criterion in [ReprojectionError, ReconstructionUncertainty, ImageCount, ProjectionAccuracy]

class Filter

Tie point cloud filter

The following example selects all tie points from the active chunk that have reprojection error higher than defined threshold:

```
>>> chunk = Metashape.app.document.chunk # active chunk
>>> threshold = 0.5
>>> f = Metashape.TiePoints.Filter()
>>> f.init(chunk, criterion = Metashape.TiePoints.Filter.ReprojectionError)
>>> f.selectPoints(threshold)
```

class Criterion

Point filtering criterion in [ReprojectionError, ReconstructionUncertainty, ImageCount, ProjectionAccuracy]

init(*points, criterion, progress*)

Initialize tie points filter based on specified criterion.

Parameters

- **points** (*Metashape.TiePoints* / *Metashape.Chunk*) – Tie points to filter.
- **criterion** (*Metashape.TiePoints.Filter.Criterion*) – Point filter criterion.
- **progress** (*Callable[[float], None]*) – Progress callback.

max_value

Maximum value.

Type

int | float

min_value

Minimum value.

Type

int | float

removePoints(*threshold*)

Remove points based on specified threshold.

Parameters**threshold** (*float*) – Criterion threshold.**resetSelection()**

Reset previously made selection.

selectPoints(*threshold*)

Select points based on specified threshold.

Parameters**threshold** (*float*) – Criterion threshold.**values**

List of values.

Type

list[int] | list[float]

class Point

3D point in the tie point cloud

coord

Point coordinates.

Type*Metashape.Vector***cov**

Point coordinates covariance matrix.

Type*Metashape.Matrix***selected**

Point selection flag.

Type

bool

track_id

Track index.

Type

int

valid

Point valid flag.

Type

bool

class Points

Collection of 3D points in the tie point cloud

copy()

Returns a copy of points buffer.

Returns

Copy of points buffer.

Return type*Metashape.TiePoints.Points***resize**(*count*)

Resize points list.

Parameters**count** (*int*) – new point count**class Projection**

Projection of the 3D point on the photo

coord

2D projection coordinates.

Type*Metashape.Vector***size**

Point size.

Type

float

track_id

Track index.

Type

int

class ProjectionsCollection of *Metashape.TiePoints.Projection* for the camera**copy()**

Returns a copy of projections buffer.

Returns

Copy of projections buffer.

Return type*Metashape.TiePoints.Projections***resize(count)**

Resize projections list.

Parameters**count** (*int*) – new projections count**class Track**

Track in the tie point cloud

color

Track color.

Type

tuple[int | float, ...]

class Tracks

Collection of tracks in the tie point cloud

copy()

Returns a copy of tracks buffer.

Returns

Copy of tracks buffer.

Return type*Metashape.TiePoints.Tracks***resize(count)**

Resize track list.

Parameters**count** (*int*) – new track count**bands**

List of color bands.

Type

list[str]

cleanup([*progress*])

Remove points with insufficient number of projections.

Parameters**progress** (*Callable[[float], None]*) – Progress callback.**copy**(*keypoints=True*)

Returns a copy of the tie point cloud.

Parameters**keypoints** (*bool*) – copy key points data.**Returns**

Copy of the tie point cloud.

Return type*Metashape.TiePoints***cropSelectedPoints**()

Crop selected points.

cropSelectedTracks()

Crop selected tie points.

data_type

Data type used to store color values.

Type*Metashape.DataType***export**(*path*, *format='obj'*[, *projection*])

Export tie points.

Parameters

- **path** (*str*) – Path to output file.
- **format** (*str*) – Export format in ['obj', 'ply'].
- **projection** (*Metashape.Matrix* / *Metashape.CoordinateSystem*) – Sets output projection.

invertSelection()

Invert selection.

meta

Tie points meta data.

Type*Metashape.MetaData*

modified

Modified flag.

Type

bool

pickPoint(*origin, target, endpoints=1*)

Returns ray intersection with the tie point cloud (point on the ray nearest to some point).

Parameters

- **origin** (*Metashape.Vector*) – Ray origin.
- **target** (*Metashape.Vector*) – Point on the ray.
- **endpoints** (*int*) – Number of endpoints to check for (0 - line, 1 - ray, 2 - segment).

Returns

Coordinates of the intersection point.

Return type

Metashape.Vector

points

List of points.

Type

Metashape.TiePoints.Points

projections

Point projections for each photo.

Type

Metashape.TiePoints.Projections

removeKeypoints()

Remove keypoints from tie point cloud.

removeSelectedPoints()

Remove selected points.

removeSelectedTracks()

Remove selected tie points.

renderDepth(*transform, calibration, point_size=1, cull_points=False, add_alpha=True*)

Render tie points depth image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **point_size** (*int*) – Point size.
- **cull_points** (*bool*) – Enable normal based culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

Returns

Rendered image.

Return type

Metashape.Image

renderImage(*transform, calibration, point_size=1, cull_points=False, add_alpha=True, raster_transform=RasterTransformNone*)

Render tie points image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **point_size** (*int*) – Point size.
- **cull_points** (*bool*) – Enable normal based culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.
- **raster_transform** (*Metashape.RasterTransformType*) – Raster band transformation.

Returns

Rendered image.

Return type

Metashape.Image

renderMask(*transform, calibration, point_size=1, cull_points=False*)

Render tie points mask image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **point_size** (*int*) – Point size.
- **cull_points** (*bool*) – Enable normal based culling.

Returns

Rendered image.

Return type

Metashape.Image

renderNormalMap(*transform, calibration, point_size=1, cull_points=False, add_alpha=True*)

Render image with tie points normals for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **point_size** (*int*) – Point size.
- **cull_points** (*bool*) – Enable normal based culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

Returns

Rendered image.

Return type

Metashape.Image

renderPreview(*width = 2048, height = 2048*[, *transform*], *point_size=1*[, *progress*])

Generate tie points preview image.

Parameters

- **width** (*int*) – Preview image width.
- **height** (*int*) – Preview image height.
- **transform** (*Metashape.Matrix*) – 4x4 viewpoint transformation matrix.
- **point_size** (*int*) – Point size.
- **progress** (*Callable[[float], None]*) – Progress callback.

Returns

Preview image.

Return type

Metashape.Image

tracks

List of tracks.

Type

Metashape.TiePoints.Tracks

class Metashape.TiledModel

Tiled model data.

class FaceCount

Tiled model face count in [LowFaceCount, MediumFaceCount, HighFaceCount]

bands

List of color bands.

Type

list[str]

clear()

Clears tiled model data.

copy()

Create a copy of the tiled model.

Returns

Copy of the tiled model.

Return type

Metashape.TiledModel

crs

Reference coordinate system.

Type

Metashape.CoordinateSystem | None

data_type

Data type used to store color values.

Type

Metashape.DataType

key

Tiled model identifier.

Type
int

label

Tiled model label.

Type
str

meta

Tiled model meta data.

Type
Metashape.MetaData

modified

Modified flag.

Type
bool

pickPoint(*origin, target, endpoints=1*)

Returns ray intersection with the tiled model.

Parameters

- **origin** (*Metashape.Vector*) – Ray origin.
- **target** (*Metashape.Vector*) – Point on the ray.
- **endpoints** (*int*) – Number of endpoints to check for (0 - line, 1 - ray, 2 - segment).

Returns

Coordinates of the intersection point.

Return type

Metashape.Vector

renderDepth(*transform, calibration, resolution=1, cull_faces=True, add_alpha=True*)

Render tiled model depth image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_faces** (*bool*) – Enable back-face culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.

Returns

Rendered image.

Return type

Metashape.Image

renderImage(*transform, calibration, resolution=1, cull_faces=True, add_alpha=True, raster_transform=RasterTransformNone, matcap_image, smooth_normals=True, color*)

Render tiled model image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_faces** (*bool*) – Enable back-face culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.
- **raster_transform** (*Metashape.RasterTransformType*) – Raster band transformation.
- **matcap_image** (*Metashape.Image*) – Matcap image used to shade model.
- **smooth_normals** – Enable normals smoothing.:type smooth_normals: bool
- **color** (*list[int]:return: Rendered image.*) – Solid view color.

Return type

Metashape.Image

renderMask(*transform, calibration, resolution=1, cull_faces=True*)

Render tiled model mask image for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_faces** (*bool*) – Enable back-face culling.

Returns

Rendered image.

Return type

Metashape.Image

renderNormalMap(*transform, calibration, resolution=1, cull_faces=True, add_alpha=True*)

Render image with tiled model normals for specified viewpoint.

Parameters

- **transform** (*Metashape.Matrix*) – Camera location.
- **calibration** (*Metashape.Calibration*) – Camera calibration.
- **resolution** (*float*) – Level of detail resolution in screen pixels.
- **cull_faces** (*bool*) – Enable back-face culling.
- **add_alpha** (*bool*) – Generate image with alpha channel.
- **smooth_normals** – Enable normals smoothing.:type smooth_normals: bool

Returns

Rendered image.

Return type*Metashape.Image***renderPreview**(*width* = 2048, *height* = 2048[, *transform*][, *progress*])

Generate tiled model preview image.

Parameters

- **width** (*int*) – Preview image width.
- **height** (*int*) – Preview image height.
- **transform** (*Metashape.Matrix*) – 4x4 viewpoint transformation matrix.
- **progress** (*Callable[[float], None]*) – Progress callback.

Returns

Preview image.

Return type*Metashape.Image***resolution**

Tiled model resolution in m/pix.

Type

float

transform

4x4 tiled model transformation matrix.

Type*Metashape.Matrix***class Metashape.TiledModelFormat**

Tiled model format in [TiledModelFormatNone, TiledModelFormatTLS, TiledModelFormatLOD, TiledModelFormatZIP, TiledModelFormatCesium, TiledModelFormatSLPK, TiledModelFormatOSGB, TiledModelFormatOSGT, TiledModelFormat3MX]

class Metashape.Trajectory

Trajectory data.

class Position

Trajectory position

location

Position coordinates.

Type*Metashape.Vector***masked**

Position mask flag.

Type

bool

rotation

Rotation vector.

Type*Metashape.Vector*

selected

Position selection flag.

Type

bool

time

Position timestamp.

Type

float

class Positions

Collection of trajectory positions

copy()

Returns a copy of position list.

Returns

Copy of position list.

Return type

Metashape.Trajectory.Positions

resize(count)

Resize position list.

Parameters

count (*int*) – new position count

addTimeOffset(offset)

Add time offset to trajectory positions.

Parameters

offset (*float*) – Time offset to add, in seconds.

antenna

GPS antenna correction.

Type

Metashape.Antenna

clear()

Clear trajectory data.

copy()

Create a copy of the trajectory.

Returns

Copy of the trajectory.

Return type

Metashape.Trajectory

createMask(heading_threshold=10, min_duration=5, min_distance=20, crop_with_data=False, trim_ends=True[, progress])

Create automatic trajectory mask.

Parameters

- **heading_threshold** (*float*) – Maximum difference of heading in segment, in degrees.
- **min_duration** (*float*) – Minimal time duration of segment, in seconds.
- **min_distance** (*float*) – Minimal distance of segment, in meters.

- **crop_with_data** (*bool*) – Enable segment cropping with corresponding point clouds.
- **trim_ends** (*bool*) – Enable segment ends trimming.
- **progress** (*Callable[[float], None]*) – Progress callback.

cropMaskBySelection()

Crop trajectory mask by selection.

crs

Reference coordinate system.

Type

Metashape.CoordinateSystem | None

extent

Trajectory extent in local trajectory coordinate system.

Type

Metashape.BBox

interpolate(*time*, *max_interval=0*)

Interpolate trajectory at specified time moment.

Parameters

- **time** (*float*) – Time to interpolate at.
- **max_interval** (*float*) – Maximum sampling interval allowed for interpolation (unlimited if 0).

Returns

Interpolated trajectory position.

Return type

Metashape.Trajectory.Position

invertSelection()

Invert selection.

key

Trajectory identifier.

Type

int

label

Trajectory label.

Type

str

maskSelectedPositions()

Mask selected trajectory positions.

meta

Trajectory meta data.

Type

Metashape.MetaData

modified

Modified flag.

Type

bool

position_count

Number of positions in trajectory.

Type

int

positions

List of trajectory positions.

Type

Metashape.Trajectory.Positions

resetMask()

Reset trajectory mask.

sampling_interval

Trajectory sampling interval.

Type

float

selected

Selects/deselects the trajectory.

Type

bool

transform

4x4 trajectory transformation matrix.

Type

Metashape.Matrix

unmaskSelectedPositions()

Unmask selected trajectory positions.

class Metashape.TrajectoryFormat

Trajectory format in [TrajectoryFormatNone, TrajectoryFormatCSV, TrajectoryFormatSBET, TrajectoryFormatSOL, TrajectoryFormatTRJ]

class Metashape.Utils

Utility functions.

createChessboardImage(calib, cell_size=150, max_tilt=30)

Synthesizes photo of a chessboard.

Parameters

- **calib** (*Metashape.Calibration*) – Camera calibration.
- **cell_size** (*float*) – Chessboard cell size.
- **max_tilt** (*float*) – Maximum camera tilt in degrees.

Returns

Resulting image.

Return type*Metashape.Image***createDifferenceMask**(*image, background, tolerance=10, fit_colors=True*)

Creates mask from a pair of images or an image and specified color.

Parameters

- **image** (*Metashape.Image*) – Image to be masked.
- **background** (*Metashape.Image* | *tuple[int, ...]*) – Background image or color value.
- **tolerance** (*int*) – Tolerance value.
- **fit_colors** (*bool*) – Enables white balance correction.

Returns

Resulting mask.

Return type*Metashape.Image***createMarkers**(*chunk, projections*)

Creates markers from a list of non coded projections.

Parameters

- **chunk** (*Metashape.Chunk*) – Chunk to create markers in.
- **projections** (*list[tuple[Metashape.Camera, Metashape.Target]]*) – List of marker projections.

detectTargets(*image, type=TargetCircular12bit, tolerance=50, inverted=False, noparity=False[, minimum_size][, minimum_dist]*)

Detect targets on the image.

Parameters

- **image** (*Metashape.Image*) – Image to process.
- **type** (*Metashape.TargetType*) – Type of targets.
- **tolerance** (*int*) – Detector tolerance (0 - 100).
- **inverted** (*bool*) – Detect markers on black background.
- **noparity** (*bool*) – Disable parity checking.
- **minimum_size** (*int*) – Minimum target radius in pixels to be detected (CrossTarget type only).
- **minimum_dist** (*int*) – Minimum distance between targets in pixels (CrossTarget type only).

Returns

List of detected targets.

Return type*list[Metashape.Target]***dmat2euler**(*R, dR, euler_angles=EulerAnglesYPR*)

Calculate tangent euler rotation vector from tangent rotation matrix.

Parameters

- **R** (`Metashape.Matrix`) – Rotation matrix.
- **dR** (`Metashape.Matrix`) – Tangent rotation matrix.
- **euler_angles** (`Metashape.EulerAngles`) – Euler angles to use.

Returns

Tangent rotation angles in degrees.

Return type

Metashape.Vector

estimateImageQuality(*image*[, *mask*])

Estimate image sharpness.

Parameters

- **image** (`Metashape.Image`) – Image to be analyzed.
- **mask** (`Metashape.Image`) – Mask of the analyzed image region.

Returns

Quality metric.

Return type

float

euler2mat(*rotation*, *euler_angles=EulerAnglesYPR*)

Calculate camera to world rotation matrix from euler rotation angles.

Parameters

- **rotation** (`Metashape.Vector`) – Rotation vector.
- **euler_angles** (`Metashape.EulerAngles`) – Euler angles to use.

Returns

Rotation matrix.

Return type

Metashape.Matrix

mat2euler(*R*, *euler_angles=EulerAnglesYPR*)

Calculate euler rotation angles from camera to world rotation matrix.

Parameters

- **R** (`Metashape.Matrix`) – Rotation matrix.
- **euler_angles** (`Metashape.EulerAngles`) – Euler angles to use.

Returns

Rotation angles in degrees.

Return type

Metashape.Vector

mat2opk(*R*)

Calculate omega, phi, kappa from camera to world rotation matrix.

Parameters

R (`Metashape.Matrix`) – Rotation matrix.

Returns

Omega, phi, kappa angles in degrees.

Return type*Metashape.Vector***mat2rvec**(*R*)

Calculate rotation vector from rotation matrix.

Parameters**R** (*Metashape.Matrix*) – Rotation matrix.**Returns**

Rotation vector.

Return type*Metashape.Vector***mat2ypr**(*R*)

Calculate yaw, pitch, roll from camera to world rotation matrix.

Parameters**R** (*Metashape.Matrix*) – Rotation matrix.**Returns**

Yaw, pitch roll angles in degrees.

Return type*Metashape.Vector***opk2mat**(*angles*)

Calculate camera to world rotation matrix from omega, phi, kappa angles.

Parameters**angles** (*Metashape.Vector*) – Omega, phi, kappa angles in degrees.**Returns**

Rotation matrix.

Return type*Metashape.Matrix***rvec2mat**(*rvec*)

Calculate rotation matrix from rotation vector.

Parameters**rvec** (*Metashape.Vector*) – Rotation vector.**Returns**

Rotation matrix.

Return type*Metashape.Matrix***ypr2mat**(*angles*)

Calculate camera to world rotation matrix from yaw, pitch, roll angles.

Parameters**angles** (*Metashape.Vector*) – Yaw, pitch, roll angles in degrees.**Returns**

Rotation matrix.

Return type*Metashape.Matrix*

class Metashape.Vector

n-component vector

```
>>> import Metashape
>>> vect = Metashape.Vector( (1, 2, 3) )
>>> vect2 = vect.copy()
>>> vect2.size = 4
>>> vect2.w = 5
>>> vect2 *= -1.5
>>> vect.size = 4
>>> vect.normalize()
>>> Metashape.app.messageBox("Scalar product is " + str(vect2 * vect))
```

copy()

Return a copy of the vector.

Returns

A copy of the vector.

Return type*Metashape.Vector***cross(a, b)**

Cross product of 2 vectors.

Parameters

- **a** (*Metashape.Vector*) – First vector.
- **b** (*Metashape.Vector*) – Second vector.

Returns

Cross product.

Return type*Metashape.Vector***norm()**

Return norm of the vector.

norm2()

Return squared norm of the vector.

normalize()

Normalize vector to the unit length.

normalized()

Return a new, normalized vector.

Returns

a normalized copy of the vector

Return type*Metashape.Vector***size**

Vector dimensions.

Type

int

w

Vector W component.

Type
float

x

Vector X component.

Type
float

y

Vector Y component.

Type
float

z

Vector Z component.

Type
float

zero()

Set all elements to zero.

class Metashape.Version

Version object contains application version numbers.

build

Build number.

Type
int

copy()

Return a copy of the object.

Returns
A copy of the object.

Return type
Metashape.Version

major

Major version number.

Type
int

micro

Micro version number.

Type
int

minor

Minor version number.

Type
int

class Metashape.**Viewpoint**(*app*)

Represents viewpoint in the model view

center

Camera center.

Type

Metashape.Vector

coo

Center of orbit.

Type

Metashape.Vector

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.Viewpoint

fov

Camera vertical field of view in degrees.

Type

float

height

OpenGL window height.

Type

int

mag

Camera magnification defined by distance to the center of rotation.

Type

float

rot

Camera rotation matrix.

Type

Metashape.Matrix

width

OpenGL window width.

Type

int

class Metashape.**Vignetting**

Vignetting polynomial

copy()

Return a copy of the object.

Returns

A copy of the object.

Return type

Metashape.Vignetting

PYTHON API CHANGE LOG

3.1 Metashape version 2.2.2

- Added EulerAnglesUndefined to EulerAngles enum
- Added mat2rvec() and rvec2mat() methods to Utils class
- Added Trajectory.interpolate() method
- Added Trajectory.sampling_interval attribute
- Added Orthomosaic.Patch.inpaint attribute
- Added use_occlusion_texture and use_point_cloud_intensity arguments to Chunk.buildOrthomosaic() method
- Added save_rotation, save_location_accuracy, save_rotation_accuracy, save_errors, save_estimated, save_variance and save_enabled arguments to Chunk.exportReference() method
- Added rotation_angles, load_rotation, load_location_accuracy, load_rotation_accuracy, load_enabled, column_enabled, column_label, column_x, column_y, column_z, column_sx, column_sy, column_sz, column_a, column_b, column_c, column_sa, column_sb and column_sc arguments to Chunk.importReference() method
- Added use_occlusion_texture and use_point_cloud_intensity attributes to BuildOrthomosaic task
- Added save_rotation, save_location_accuracy, save_rotation_accuracy, save_errors, save_estimated, save_variance and save_enabled attributes to ExportReference class
- Added rotation_angles, load_rotation, load_location_accuracy, load_rotation_accuracy, load_enabled, column_enabled, column_label, column_x, column_y, column_z, column_sx, column_sy, column_sz, column_a, column_b, column_c, column_sa, column_sb and column_sc attributes to ImportReference class
- Added apply_boresight_offset, apply_trajectory_mask and merge_orthophotos attributes to MergeAssets class

3.2 Metashape version 2.2.1

- Added CleanTiePoints and CleanModel classes
- Added TiePoints.Criterion and Model.Criterion enums
- Added alignCamerasByReference(), cleanTiePoints() and cleanModel() methods to Chunk class
- Added Model.cleanModel() method
- Added Trajectory.addTimeOffset() method
- Added Trajectory.antenna attribute
- Added location_fixed and rotation_fixed attributes to Antenna class

- Added DuplicateAsset.copy_patches attribute
- Added AlignCameras.align_laser_scans attribute
- Added ExportTiledModel.zip_compression attribute
- Added align_laser_scans argument to Chunk.alignCameras() method
- Added zip_compression argument to Chunk.exportTiledModel() method
- Removed ServiceMelown from ServiceType enum

3.3 Metashape version 2.2.0

- Added Geoid class
- Added PansharpenOrthomosaic, ClassifyOverlapPoints and ImportVideo classes
- Added MasksData and BlockModelData to DataSource enum
- Added MaskingModeAI to MaskingMode enum
- Added AprilTag16h5, AprilTag25h9, AprilTag36h10, AprilTag36h11, AprilTagCircle21h7, AprilTagStandard41h12 and AprilTagStandard52h13 to TargetType enum
- Added PointCloudFormatCSV to PointCloudFormat enum
- Added PointCloudViewAccuracy to ModelView.PointCloudViewMode enum
- Added TiePointsViewImageCount to ModelView.TiePointsViewMode enum
- Added Document.addGeoid() method
- Added Chunk.pansharpenOrthomosaic() method
- Added clear() and copy() methods to Masks class
- Added PointCloud.classifyOverlapPoints() method
- Added listGeoids() and setContext() methods to CoordinateSystem class
- Added Document.geoids attribute
- Added mask_sets attribute to Chunk class
- Added bias, bias_acc, bias_covariance, bias_fixed and bias_ref attributes to Antenna class
- Added key and label attributes to Masks class
- Added transfer_texture attribute to BuildOrthomosaic class
- Added source_data attribute to BuildTexture class
- Added replace_asset and frames attributes to ColorizePointCloud, SmoothPointCloud, SmoothModel and RefineModel classes
- Added model attribute to RefineModel class
- Added copy_masks attribute to DuplicateChunk and MergeChunks classes
- Added image_path, convert_to_pinhole and save_images attributes to ExportCameras class
- Added laser_scans_use_initial_orientation attribute to MatchPhotos class
- Added ExportMasks.masks attribute
- Added frames and replace_asset attributes to GenerateMasks class

- Added columns, delimiter, generate_panorama, group_delimiters, load_images, load_point_classification, load_point_color, load_point_confidence, load_point_index, load_point_intensity, load_point_normal, load_point_return_number, load_point_scan_angle, load_point_source_id, load_point_timestamp and skip_rows attributes to ImportPointCloud class
- Added ExportPointCloud.point_clouds attribute
- Added transfer_texture argument to Chunk.buildOrthomosaic() method
- Added source_data argument to Chunk.buildTexture() method
- Added replace_asset and frames arguments to Chunk.colorizePointCloud(), Chunk.smoothPointCloud(), Chunk.smoothModel() and Chunk.refineModel() methods
- Added model argument to Chunk.refineModel() method
- Added copy_masks argument to Chunk.mergeChunks() method
- Added image_path, save_images and convert_to_pinhole arguments to Chunk.exportCameras() method
- Added laser_scans_use_initial_orientation argument to Chunk.matchPhotos() method
- Added point_clouds argument to Chunk.exportPointCloud() method
- Added replace_asset and frames arguments to Chunk.generateMasks() method
- Added columns, delimiter, generate_panorama, group_delimiters, load_images, load_point_classification, load_point_color, load_point_confidence, load_point_index, load_point_intensity, load_point_normal, load_point_return_number, load_point_scan_angle, load_point_source_id, load_point_timestamp and skip_rows arguments to Chunk.importPointCloud() method
- Added progress argument to Chunk.importVideo() method
- Added matcap_image, smooth_normals and color arguments to Model.renderImage() method
- Added smooth_normals argument to Model.renderNormalMap() method
- Added matcap_image, smooth_normals and color arguments to TiledModel.renderImage() method
- Added smooth_normals argument to TiledModel.renderNormalMap() method
- Changed units for time_start and time_end arguments to seconds in Chunk.importVideo() method
- Changed default value of clip_to_region attribute to False for ExportPointCloud, FilterPointCloud and SmoothPointCloud classes
- Changed default value of clip_to_region argument to False in Chunk.exportPointCloud(), Chunk.filterPointCloud() and Chunk.smoothPointCloud() methods
- Renamed BuildTexture.source_model attribute to source_asset
- Removed NetworkClient.setMasterServer() method
- Removed NetworkTask.encode() method
- Removed ExportPointCloud.point_cloud attribute
- Removed ignore_normals and import_images attributes from ImportPointCloud class
- Removed point_cloud argument from Chunk.exportPointCloud() method
- Removed ignore_normals and import_images arguments from Chunk.importPointCloud() method

3.4 Metashape version 2.1.4

- Added PointCloud.generatePanorama() method
- Added enabled and selected attributes to Model class
- Added key and selected attributes to CameraTrack class
- Added block_margin and clip_to_block attributes to ExportModel class
- Added group_delimiters attribute to ImportTrajectory class
- Added clip_to_block and block_margin arguments to Chunk.exportModel() method
- Added group_delimiters argument to Chunk.importTrajectory() method

3.5 Metashape version 2.1.3

- Added Trajectory class
- Added PointCloud.Point, PointCloud.Points and PointCloud.Reader classes
- Added Elevation.Patch and Elevation.Patches classes
- Added Application.PhotoView class
- Added CamerasFormatColmap to CamerasFormat enum
- Added addModelGroup(), addTrajectory(), findModelGroup() and findTrajectory() methods to Chunk class
- Added invertSelection() method to TiePoints, PointCloud and Model classes
- Added extent() and selectPointsByRegion() methods to PointCloud class
- Added altitudeSlopeAspect(), coverageArea() and update() methods to Elevation class
- Added camera() and coverageArea() methods to Orthomosaic class
- Added trajectory and trajectories attributes to Chunk class
- Added palette_absolute_values and patches attributes to Elevation class
- Added bands and data_type attributes to Model.Texture class
- Added block_index and block_region attributes to Model class
- Added point_count_by_class attribute to PointCloud class
- Added resolution attribute to TiledModel class
- Added show_basemap, show_cameras, show_elevation, show_laser_scans, show_markers, show_orthomosaic, show_shapes and show_trajectory attributes to ModelView class
- Added center, width, height, projection and scale attributes to OrthoView class
- Added Application.photo_view attribute
- Added merge_markers attribute to DetectMarkers class
- Added copy_orthophotos attribute to DuplicateAsset class
- Added copy_laser_scans, cameras and laser_scans attributes to DuplicateChunk class
- Added cameras, image_compression and save_masks attributes to ExportCameras class
- Added logo_path attribute to ExportReport class

- Added clip_to_boundary and copy_orthophotos attributes to TransformRaster class
- Added cameras and laser_scans arguments to Chunk.copy() method
- Added merge_markers argument to Chunk.detectMarkers() method
- Added save_masks, image_compression, cameras and chan_rotation_order arguments to Chunk.exportCameras() method
- Added logo_path argument to Chunk.exportReport() method
- Added clip_to_boundary and copy_orthophotos arguments to Chunk.transformRaster() method

3.6 Metashape version 2.1.2

- Added ServiceNira and ServiceAgisoftCloud to ServiceType enum
- Added ReferenceItemsAll to ReferenceItems enum
- Added Chunk.convertImages() method
- Added alignNormals(), invertNormals() and setPointReturnsFilter() methods to PointCloud class
- Added ModelGroup.renderPreview() method
- Added Camera.point_cloud attribute
- Added borrowed, floating and rehostable attributes to License class
- Added clip_to_region attribute to ExportModel, ExportTiledModel, ExportPointCloud, FilterPointCloud, SmoothPointCloud and DuplicateAsset classes
- Added save_absolute_paths attribute to ExportCameras class
- Added save_elevation attribute to ExportShapes class
- Added project_id and upload_images attributes to PublishData class
- Added clip_to_region argument to Chunk.exportModel(), Chunk.exportTiledModel(), Chunk.exportPointCloud(), Chunk.filterPointCloud() and Chunk.smoothPointCloud() methods
- Added save_absolute_paths argument to Chunk.exportCameras() method
- Added save_elevation argument to Chunk.exportShapes() method
- Added project_id and upload_images arguments to Chunk.publishData() method
- Added only_visible argument to PointCloud.selectMaskedPoints() class

3.7 Metashape version 2.1.1

- Added Document.sortChunks() method
- Added Model.setVertexColors() method
- Added key attribute to CameraGroup, MarkerGroup and ScalebarGroup classes
- Added BuildTexture.anti_aliasing attribute
- Added ExportModel.glTF_y_up attribute
- Added anti_aliasing argument to Chunk.buildTexture() method
- Added glTF_y_up argument to Chunk.exportModel() method

3.8 Metashape version 2.1.0

- Added Component and ModelGroup classes
- Added TrajectoryData, LaserScansData and DepthMapsAndLaserScansData to DataSource enum
- Added PointCloudFormatCOPC to PointCloudFormat enum
- Added ModelViewElevation to ModelView.ModelViewMode enum
- Added TiePointsViewElevation to ModelView.TiePointsViewMode enum
- Added TiledModelViewElevation to ModelView.TiledModelViewMode enum
- Added Chunk.mergeComponents() and Chunk.splitComponents() methods
- Added Elevation.pickPoint() method
- Added ModelView.captureVideo() method
- Added Camera.component attribute
- Added loop and smooth attributes to CameraTrack class
- Added component, components, model_group and model_groups attributes to Chunk class
- Added crs, group and transform attributes to Model class
- Added PointCloud.component attribute
- Added replace_asset and frames attributes to BuildModel, BuildTiledModel, BuildPointCloud, BuildDem, BuildOrthomosaic, DecimateModel, FilterPointCloud, ImportRaster and TransformRaster classes
- Added split_in_blocks, blocks_crs, blocks_size, blocks_origin, clip_to_boundary, export_blocks, build_texture and output_folder attributes to BuildModel class
- Added workitem_size_cameras and max_workgroup_size attributes to BuildTexture class
- Added BuildUV.pixel_size attribute
- Added ClassifyGroundPoints.max_terrain_slope attribute
- Added ExportPointCloud.tileset_version attribute
- Added ExportRaster.asset attribute
- Added model attribute to ColorizeModel and SmoothModel classes
- Added tiled_model, tileset_version, model_group, pixel_size, tile_size and face_count attributes to ExportTiledModel class
- Added replace_asset and frame_paths attributes to ImportModel class
- Added match_laser_scans, downscale_3d, keypoint_limit_3d and laser_scans_vertical_axis attributes to MatchPhotos class
- Added classes and apply_to_selection attributes to SmoothPointCloud class
- Added ImportPointCloud.ignore_normals attribute
- Added replace_asset and frames arguments to Chunk.buildModel(), Chunk.buildTiledModel(), Chunk.buildPointCloud(), Chunk.buildDem(), Chunk.buildOrthomosaic(), Chunk.decimateModel(), Chunk.filterPointCloud(), Chunk.importRaster() and Chunk.transformRaster() methods
- Added replace_asset and frame_paths arguments to Chunk.importModel() method
- Added split_in_blocks, blocks_crs, blocks_size, blocks_origin, clip_to_boundary, export_blocks, build_texture and output_folder arguments to Chunk.buildModel() method

- Added `workitem_size_cameras` and `max_workgroup_size` arguments to `Chunk.buildTexture()` method
- Added `pixel_size` argument to `Chunk.buildUV()` method
- Added `max_terrain_slope` argument to `Chunk.classifyGroundPoints()` method
- Added `tileset_version` argument to `Chunk.exportPointCloud()` method
- Added `asset` argument to `Chunk.exportRaster()` method
- Added `model` argument to `Chunk.colorizeModel()` and `Chunk.smoothModel()` methods
- Added `tiled_model`, `tileset_version`, `model_group`, `pixel_size`, `tile_size` and `face_count` arguments to `Chunk.exportTiledModel()` method
- Added `match_laser_scans`, `downscale_3d`, `keypoint_limit_3d` and `laser_scans_vertical_axis` arguments to `Chunk.matchPhotos()` method
- Added classes and `apply_to_selection` arguments to `Chunk.smoothPointCloud()` method
- Added `ignore_normals` argument to `Chunk.importPointCloud()` method
- Added `publish` argument to `CloudClient.uploadProject()` method
- Replaced `ExportTiledModel.use_rtc_center` attribute with `use_tileset_transform`
- Replaced `use_rtc_center` argument in `Chunk.exportTiledModel()` method with `use_tileset_transform`
- Renamed `RefineMesh` class to `RefineModel`
- Renamed `Chunk.refineMesh()` method to `refineModel()`
- Renamed `Model.transform()` method to `transformVertices()`
- Renamed `NetworkClient.serverInfo()` method to `serverVersion()`
- Renamed `NetworkClient.serverStatus()` method to `serverInfo()`
- Renamed `NetworkClient.batchStatus()` method to `batchInfo()`
- Renamed `NetworkClient.dumpBatches()` method to `exportBatches()`
- Renamed `NetworkClient.loadBatches()` method to `importBatches()`
- Renamed `NetworkClient.setBatchNodeLimit()` method to `setBatchWorkerLimit()`
- Renamed `NetworkClient.nodeList()` method to `workerList()`
- Renamed `NetworkClient.nodeStatus()` method to `workerInfo()`
- Renamed `NetworkClient.quitNode()` method to `quitWorker()`
- Renamed `NetworkClient.abortNode()` method to `abortWorker()`
- Renamed `NetworkClient.setNodeCPUEnable()` method to `setWorkerCpuEnabled()`
- Renamed `NetworkClient.setNodeCapability()` method to `setWorkerCapability()`
- Renamed `NetworkClient.setNodeGPUMask()` method to `setWorkerGpuMask()`
- Renamed `NetworkClient.setNodePaused()` method to `setWorkerPaused()`
- Renamed `NetworkClient.setNodePriority()` method to `setWorkerPriority()`
- Renamed `NetworkTask.supports_gpu` attribute to `gpu_support`
- Renamed `supports_gpu` attribute to `gpu_support` in task classes
- Renamed `DecimateModel.asset` attribute to `model`
- Renamed `TransformRaster.data_source` attribute to `source_data`

- Renamed `RenderDepthMaps.export_depth`, `export_diffuse` and `export_normals` attributes to `save_depth`, `save_diffuse` and `save_normals`
- Renamed `asset` argument in `Chunk.decimateModel()` method to `model`
- Renamed `data_source` argument in `Chunk.transformRaster()` method to `source_data`
- Added `.pyi` stub file to stand-alone Python module for autocompletion in external IDEs

3.9 Metashape version 2.0.4

- Added `borrowLicense()` and `returnLicense()` methods to `License` class
- Added `removeTextures()`, `removeUV()`, `removeVertexColors()` and `removeVertexConfidence()` methods to `Model` class
- Added `License.expiration` attribute
- Added `publish` argument to `CloudClient.uploadProject()` method
- Added `format` argument to `RPCModel.load()` and `RPCModel.save()` methods

3.10 Metashape version 2.0.3

- Added `SmoothPointCloud` class
- Added `Chunk.smoothPointCloud()` method
- Added `enabled` and `selected` attributes to `PointCloud` class
- Added `mask_dark_pixels` and `frame_detector` attributes to `DetectFiducials` class
- Added `mask_dark_pixels` and `frame_detector` arguments to `Chunk.detectFiducials()` method

3.11 Metashape version 2.0.2

- Added `PointCloudGroup` class
- Added `TiledModelFormat3MX` to `TiledModelFormat` enum
- Added `Chunk.addPointCloudGroup()` and `Chunk.findPointCloudGroup()` methods
- Added `Chunk.point_cloud_groups` attribute
- Added `PointCloud.group` and `PointCloud.is_laser_scan` attributes

3.12 Metashape version 2.0.1

- Added License.install() method
- Added DetectFiducials.v_shape_detector attribute
- Added model and save_metadata_xml attributes to ExportModel task
- Added v_shape_detector argument to Chunk.detectFiducials() method
- Added model and save_metadata_xml arguments to Chunk.exportModel() method
- Replaced license_key argument with activation_params in License.activateOffline() method

3.13 Metashape version 2.0.0

- Added TrajectoryFormat enum
- Added DisplacementMap to Model.TextureType enum
- Added ImportTrajectory class
- Added ImportDepthImages class
- Added Chunk.importTrajectory() method
- Added Chunk.importDepthImages() method
- Added AlignCameras.point_clouds attribute
- Added ImportDepthImages.color_filenames attribute
- Added precision, is_laser_scan, replace_asset, import_images, scanner_at_origin, ignore_scanner_origin, ignore_trajectory, trajectory and frame_paths attributes to ImportPointCloud class
- Added keep_existing, return_number and point_cloud attributes to ClassifyGroundPoints class
- Added point_cloud attribute to ClassifyPoints, ColorizePointCloud, CalculatePointNormals, CompactPointCloud and ExportPointCloud classes
- Added max_quantization_error attribute to DetectPowerlines class
- Added use_rtc_center attribute to ExportTiledModel class
- Added merge_assets, copy_laser_scans, copy_depth_maps, copy_point_clouds, copy_models, copy_tiled_models, copy_elevations and copy_orthomosaics attributes to MergeChunks class
- Added point_clouds argument to Chunk.alignCameras() method
- Added color_filenames argument to Chunk.importDepthImages() method
- Added precision, is_laser_scan, replace_asset, import_images, scanner_at_origin, ignore_scanner_origin, ignore_trajectory, trajectory and frame_paths arguments to Chunk.importPointCloud() method
- Added point_cloud argument to Chunk.calculatePointNormals(), Chunk.colorizePointCloud() and Chunk.exportPointCloud() methods
- Added max_quantization_error argument to Chunk.detectPowerlines() method
- Added keep_existing and return_number arguments to PointCloud.classifyGroundPoints() method
- Added use_rtc_center argument to Chunk.exportTiledModel() method
- Added merge_assets, copy_laser_scans, copy_depth_maps, copy_point_clouds, copy_models, copy_tiled_models, copy_elevations and copy_orthomosaics arguments to Document.mergeChunks() method

- Added `drone_name`, `payload_name` and `payload_position` arguments to `CameraTrack.save()` method
- Change default `source_data` argument value for `Chunk.buildModel()` and `Chunk.buildTiledModel()` methods to `DepthMapsData`
- Renamed `PointsFormat` enum to `PointCloudFormat`
- Renamed `ModelView.PointCloudViewMode` enum to `ModelView.TiePointsViewMode`
- Renamed `ModelView.DenseCloudViewMode` enum to `ModelView.PointCloudViewMode` and added `PointCloudViewSolid`, `PointCloudViewIntensity`, `PointCloudViewElevation`, `PointCloudViewReturnNumber`, `PointCloudViewScanAngle`, `PointCloudViewSourceId` enumeration values
- Renamed `DataSource.PointCloudData` enum value to `DataSource.TiePointsData`
- Renamed `DataSource.DenseCloudData` enum value to `DataSource.PointCloudData`
- Renamed `PointCloud` class to `TiePoints`
- Renamed `DenseCloud` class to `PointCloud`
- Renamed `AnalyzePhotos` class to `AnalyzeImages`
- Renamed `BuildDenseCloud` class to `BuildPointCloud`
- Renamed `CalibrateLens` class to `CalibrateCamera`
- Renamed `ColorizeDenseCloud` class to `ColorizePointCloud`
- Renamed `CompactDenseCloud` class to `CompactPointCloud`
- Renamed `ExportDepth` class to `RenderDepthMaps`
- Renamed `ExportPoints` class to `ExportPointCloud`
- Renamed `FilterDenseCloud` class to `FilterPointCloud`
- Renamed `ImportPoints` class to `ImportPointCloud`
- Renamed `TriangulatePoints` class to `TriangulateTiePoints`
- Renamed `Chunk.addDenseCloud()` method to `addPointCloud()`
- Renamed `Chunk.analyzePhotos()` method to `analyzeImages()`
- Renamed `Chunk.buildDenseCloud()` method to `buildPointCloud()`
- Renamed `Chunk.colorizeDenseCloud()` method to `colorizePointCloud()`
- Renamed `Chunk.exportPoints()` method to `exportPointCloud()`
- Renamed `Chunk.filterDenseCloud()` method to `filterPointCloud()`
- Renamed `Chunk.findDenseCloud()` method to `findPointCloud()`
- Renamed `Chunk.importPoints()` method to `importPointCloud()`
- Renamed `Chunk.thinPointCloud()` method to `thinTiePoints()`
- Renamed `Chunk.triangulatePoints()` method to `triangulateTiePoints()`
- Renamed `Chunk.point_cloud` attribute to `tie_points`
- Renamed `Chunk.dense_cloud` attribute to `point_cloud`
- Renamed `Chunk.dense_clouds` attribute to `point_clouds`
- Renamed `ModelView.point_cloud_view_mode` attribute to `tie_points_view_mode`
- Renamed `ModelView.dense_cloud_view_mode` attribute to `point_cloud_view_mode`

- Renamed AddFrames.copy_dense_cloud attribute to copy_point_cloud
- Renamed DuplicateChunk.copy_dense_clouds attribute to copy_point_clouds
- Renamed FilterPointCloud.asset attribute to point_cloud
- Renamed PublishData.save_point_colors attribute to save_point_color
- Renamed copy_dense_cloud argument in Chunk.addFrames() method to copy_point_cloud
- Renamed save_point_colors argument in Chunk.publishData() method to save_point_color
- Renamed asset argument in Chunk.filterPointCloud() method to point_cloud
- Renamed source argument in PointCloud.classifyGroundPoints() method to source_class
- Revised parameter names for point attributes in ExportPointCloud class and Chunk.exportPointCloud() methods
- Removed ImportLaserScans class
- Removed Chunk.importLaserScans() method
- Removed Chunk.samplePoints() method
- Removed use_trajectory, traj_path, traj_columns, traj_delimiter and traj_skip_rows attributes from ImportPointCloud class
- Removed use_trajectory, traj_path, traj_columns, traj_delimiter and traj_skip_rows arguments from Chunk.importPointCloud() method
- Removed merge_depth_maps, merge_dense_clouds, merge_models, merge_elevations and merge_orthomosaics attributes from MergeChunks class
- Removed merge_depth_maps, merge_dense_clouds, merge_models, merge_elevations and merge_orthomosaics arguments from Document.mergeChunks() method

3.14 Metashape version 1.8.5

- Added DetectPowerlines class
- Added Chunk.detectPowerlines() method
- Added CameraTrack.interpolate() method
- Added generic_detector, right_angle_detector, fiducials_position_corners and fiducials_position_sides attributes to DetectFiducials class
- Added archive attribute to LoadProject and SaveProject classes
- Added generic_detector, right_angle_detector, fiducials_position_corners and fiducials_position_sides arguments to Chunk.detectFiducials() method
- Added archive argument to Document.open() and Document.save() methods

3.15 Metashape version 1.8.4

- Added Shutter.Model enum
- Added ImageFormatBZ2, ImageFormatASCII and ImageFormatKTX to ImageFormat enum
- Added Shape.areaFitted() method
- Added ExportPoints.folder_depth and ExportTiledModel.folder_depth attributes
- Added ImportLaserScans.multipane attribute
- Added folder_depth argument to Chunk.exportPoints() and Chunk.exportTiledModel() methods
- Added multipane argument to Chunk.importLaserScans() method
- Changed type of Sensor.rolling_shutter attribute to Shutter.Model
- Fixed Antenna.location and Antenna.rotation attributes to return non-None values

3.16 Metashape version 1.8.3

- Added CloudClient class
- Added PublishData class
- Added CalibrationFormatSTMap to CalibrationFormat enum
- Reorganized arguments of Chunk.publishData() method

3.17 Metashape version 1.8.2

No Python API changes

3.18 Metashape version 1.8.1

- Added CamerasFormatMA to CamerasFormat enum
- Added global_profile attribute to ExportRaster class
- Added traj_columns, traj_delimiter, traj_path, traj_skip_rows and use_trajectory attributes to ImportPoints class
- Added global_profile argument to Chunk.exportRaster() method
- Added use_trajectory, traj_path, traj_columns, traj_delimiter and traj_skip_rows arguments to Chunk.importPoints() method
- Removed fix_pixel_aspect, fix_principal_point, and remove_distortions attributes from ConvertImages class

3.19 Metashape version 1.8.0

- Added BuildPanorama and CalculatePointNormals classes
- Added ImageFormatJXL to ImageFormat enum
- Added Cylindrical to Sensor.Type enum
- Added Chunk.buildPanorama(), Chunk.calculatePointNormals() and Chunk.filterDenseCloud() methods
- Added findCamera(), findCameraGroup(), findCameraTrack(), findDenseCloud(), findDepthMaps(), findElevation(), findMarker(), findMarkerGroup(), findModel(), findOrthomosaic(), findScalebar(), findScalebarGroup(), findSensor() and findTiledModel() methods to Chunk class
- Added NetworkClient.serverStatus() method
- Added NetworkClient.setBatchPaused() and NetworkClient.setNodePaused() methods
- Added Settings.project_absolute_paths and Settings.project_compression attributes
- Added CloseHoles.apply_to_selection attribute
- Added ConvertImages.merge_planes attribute
- Added ExportPoints.screen_space_error and ExportTiledModel.screen_space_error attributes
- Added ExportReport.font_size attribute
- Added ImportPoints.point_neighbors attribute
- Added home_point, interesting_zone, powerlines, restricted_zone and safety_zone attributes to PlanMission class
- Added apply_to_selection argument to Model.closeHoles() method
- Added file_format and max_waypoints arguments to CameraTrack.save() method
- Added screen_space_error argument to Chunk.exportPoints() and Chunk.exportTiledModel() methods
- Added font_size argument to Chunk.exportReport() method
- Added point_neighbors argument to Chunk.importPoints() method
- Removed Shape.Type enum
- Removed ExportPanorama class
- Removed has_z, type, vertex_ids and vertices attributes from Shape class
- Removed pauseBatch(), resumeBatch(), pauseNode() and resumeNode() methods from NetworkClient class
- Removed PlanMission.max_waypoints attribute
- Removed SaveProject.absolute_paths and SaveProject.compression attributes
- Removed compression and absolute_paths arguments from Document.save() method
- Changed default value of BuildTiledModel.face_count attribute to 20000
- Changed default value of face_count argument in Chunk.buildTiledModel() method to 20000

3.20 Metashape version 1.7.6

- Added Cylindrical to Sensor.Type enum

3.21 Metashape version 1.7.5

- Added ClassifyGroundPoints.erosion_radius attribute
- Added erosion_radius argument to DenseCloud.classifyGroundPoints() method

3.22 Metashape version 1.7.4

- Added ServiceCesium to ServiceType enum
- Added ImportLaserScans class
- Added Chunk.colorizeDenseCloud() and Chunk.colorizeModel() methods
- Added Chunk.exportTexture() and Chunk.importLaserScans() methods
- Added breakpoints and rates attributed to GeneratePrescriptionMap class
- Added SmoothModel.preserve_edges attribute
- Added breakpoints and rates arguments to Chunk.generatePrescriptionMap() method
- Added preserve_edges argument to Chunk.smoothModel method
- Renamed ClusteringMethod enum to ClassificationMethod
- Renamed cluster_count, clustering_method and boundary attributes in GeneratePrescriptionMap class
- Renamed cluster_count, clustering_method and boundary arguments in Chunk.generatePrescriptionMap() method
- Removed ServiceSputnik from ServiceType enum
- Removed min_value, max_value and grid_azimuth attributes from GeneratePrescriptionMap class
- Removed min_value, max_value and grid_azimuth arguments from Chunk.generatePrescriptionMap() method

3.23 Metashape version 1.7.3

- Added ModelFormatOSGT and ModelFormatLandXML to ModelFormat enum
- Added TiledModelFormatOSGT to TiledModelFormat enum
- Added CoordinateSystem.datumTransform() method
- Added DenseCloud.selectPointsByShapes() method
- Added Sensor.makeMaster() method
- Added Utils.dmat2euler() method
- Added Settings.language attribute
- Added ShapeGroup.meta attribute

- Added Shapes.group attribute
- Added ExportPoints.compression attribute
- Added ExportTiledModel.model_compression attribute
- Added ImportModel.decode_udim attribute
- Added MatchPhotos.keypoint_limit_per_mpx attribute
- Added compression argument to Chunk.exportPoints() method
- Added model_compression argument to Chunk.exportTiledModel() method
- Added decode_udim argument to Chunk.importModel() method
- Added keypoint_limit_per_mpx argument to Chunk.matchPhotos() method
- Added uniform_sampling argument to Chunk.samplePoints() method

3.24 Metashape version 1.7.2

- Added ClusteringMethod enum
- Added PointsFormatSLPK to PointsFormat enum
- Added DuplicateAsset and GeneratePrescriptionMap classes
- Added Chunk.generatePrescriptionMap() method
- Added merge, operand_chunk, operand_frame and operand_asset attributes to BuildTiledModel class
- Added ExportReport.include_system_info attribute
- Added GenerateMasks.depth_threshold attribute
- Added merge, operand_chunk, operand_frame and operand_asset arguments to Chunk.buildTiledModel() method
- Added include_system_info argument to Chunk.exportReport() method
- Added depth_threshold argument to Chunk.generateMasks() method

3.25 Metashape version 1.7.1

- Removed LegacyMapping from MappingMode enum
- Removed ReduceOverlap.sensor attribute
- Removed sensor argument from Chunk.reduceOverlap() method

3.26 Metashape version 1.7.0

- Added Geometry and AttachedGeometry classes
- Added FrameStep enum
- Added ServiceType enum
- Added Chunk.importVideo(), Chunk.publishData() and Chunk.samplePoints() methods
- Added Shape.geometry and Shape.is_attached attributes
- Added alpha component to ShapeGroup.color attribute value
- Added ImportRaster.nodata_value and ImportRaster.has_nodata_value attributes
- Added MatchPhotos.filter_stationary_points attribute
- Added BuildOrthomosaic.ghosting_filter attribute
- Added attach_viewpoints, group_attached_viewpoints and horizontal_zigzags attributes to PlanMission class
- Added ReduceOverlap.sensor attribute
- Added dir argument to Application.getExistingDirectory(), getOpenFileName(), getOpenFileNames() and getSaveFileName() methods
- Added nodata_value and has_nodata_value arguments to Chunk.importRaster() method
- Added filter_stationary_points argument to Chunk.matchPhotos() method
- Added ghosting_filter argument to Chunk.buildOrthomosaic() method
- Added sensor argument to Chunk.reduceOverlap() method
- Renamed ImportMasks class to GenerateMasks
- Renamed MaskSource enum to MaskingMode
- Renamed Chunk.importMasks() method to Chunk.generateMasks()
- Removed ReduceOverlap.max_cameras attribute
- Removed max_cameras argument from Chunk.reduceOverlap() method

3.27 Metashape version 1.6.6

- Added Tasks.TransformRaster class
- Added ExportReference.precision attribute
- Added toNetworkTask() method to task classes
- Added Chunk.transformRaster() method
- Added precision argument to Chunk.exportReference() method

3.28 Metashape version 1.6.5

- Added Sensor.meta attribute

3.29 Metashape version 1.6.4

- Added Model.Vertex.confidence attribute
- Added ConvertImages.use_initial_calibration attribute
- Added image_orientation, save_invalid_matches and use_initial_calibration attributes to ExportCameras class
- Added ExportModel.save_confidence attribute
- Added crs and image_orientation attributes to ImportCameras class
- Added CalibrationFormatPhotomod to CalibrationFormat enum
- Added save_invalid_matches, use_initial_calibration and image_orientation arguments to Chunk.exportCameras() method
- Added save_confidence argument to Chunk.exportModel() method
- Added crs and image_orientation arguments to Chunk.importCameras() method
- Removed BuildUV.adaptive_resolution attribute
- Removed adaptive_resolution argument from Chunk.buildUV() method

3.30 Metashape version 1.6.3

- Added renderPreview() methods to DenseCloud, Model, Orthomosaic, PointCloud and TiledModel classes
- Added BuildUV.texture_size attribute
- Added DecimateModel.apply_to_selection attribute
- Added DetectFiducials.cameras, DetectFiducials.frames and DetectFiducials.generate_masks attributes
- Added ExportModel.embed_texture attribute
- Added clip_to_boundary attribute to ExportPoints, ExportModel, ExportTiledModel and ExportRaster classes
- Added RasterFormatGeoPackage to RasterFormat enum
- Added ShapesFormatGeoPackage to ShapesFormat enum
- Added source argument to Chunk.addSensor() method
- Added texture_size argument to Chunk.buildUV() method
- Added apply_to_selection argument to Chunk.decimateModel() method
- Added generate_masks, cameras and frames arguments to Chunk.detectFiducials() method
- Added embed_texture argument to Chunk.exportModel() method
- Added width, height, point_size and progress arguments to Chunk.renderPreview() method
- Added clip_to_boundary argument to Chunk.exportPoints(), Chunk.exportModel(), Chunk.exportTiledModel() and Chunk.exportRaster() methods

- Added meta argument to NetworkClient.createBatch() method
- Removed CalibrateLens.fit_p3 and CalibrateLens.fit_p4 attributes

3.31 Metashape version 1.6.2

- Added Application.ModelView and Application.OrthoView classes
- Added Application.removeMenuItem() method
- Added Model.transform() method
- Added PointCloud.cleanup() method
- Added Application.model_view and Application.ortho_view attributes
- Added BuildTexture.transfer_texture attribute
- Added PlanMission.min_pitch and PlanMission.max_pitch attributes
- Added columns, crs, delimiter, group_delimiters and skip_rows attributes to ImportShapes class
- Added CamerasFormatNVM to CamerasFormat enum
- Added PointsFormatPTX to PointsFormat enum
- Added ShapesFormatCSV to ShapesFormat enum
- Added transfer_texture argument to Chunk.buildTexture() method
- Added columns, crs, delimiter, group_delimiters and skip_rows arguments to Chunk.importShapes() method
- Moved ModelViewMode enum to ModelView class
- Renamed Application.console attribute to console_pane
- Renamed Application.captureModelView() method to ModelView.captureView()
- Renamed Application.captureOrthoView() method to OrthoView.captureView()
- Renamed Application.viewpoint attribute to ModelView.viewpoint
- Removed ReduceOverlap.capture_distance attribute
- Removed capture_distance argument from Chunk.reduceOverlap() method
- Changed default values of AlignCameras.reset_alignment and MatchPhotos.reset_matches attributes to False
- Changed default value of reset_alignment argument in Chunk.alignCameras() method to False
- Changed default value of reset_matches argument in Chunk.matchPhotos() method to False

3.32 Metashape version 1.6.1

- Added Application.releaseFreeMemory() method
- Added CoordinateSystem.towgs84 attribute
- Added Marker.enabled attribute
- Added BuildModel.subdivide_task attribute
- Added subdivide_task argument to Chunk.buildModel() method
- Changed default value of keep_depth argument in Chunk.buildModel() and Chunk.buildTiledModel() to True

3.33 Metashape version 1.6.0

- Added BBox, ImageCompression, RPCModel and Model.Texture classes
- Added Tasks.ImportTiledModel and Task.ColorizeModel classes
- Added CalibrationFormat and ReferencePreselectionMode enums
- Added Model.addTexture() and Model.remove() methods
- Added Model.getActiveTexture() and Model.setActiveTexture() methods
- Added NetworkClient.setMasterServer() method
- Added setClassesFilter(), setConfidenceFilter(), setSelectionFilter() and resetFilters() methods to DenseCloud class
- Added renderDepth(), renderImage(), renderMask() and renderNormalMap() methods to PointCloud, DenseCloud and TiledModel classes
- Added Chunk.renderPreview() method
- Added Utils.euler2mat() and Utils.mat2euler() methods
- Added Calibration.rpc attribute
- Added Marker.position_covariance attribute
- Added Model.textures attribute
- Added TiledModel.crs and TiledModel.transform attributes
- Added EulerAnglesPOK and EulerAnglesANK values to EulerAngles enum
- Added PointsFormatPCD to PointsFormat enum
- Added ShapesFormatGeoJSON to ShapesFormat enum
- Added RPC to Sensor.Type enum
- Added image_compression attribute to ExportOrthophotos, ExportRaster, ExportTiledModel and UndistortPhotos classes
- Added AddPhotos.load_rpc_txt attribute
- Added AlignCameras.min_image attribute
- Added BuildDenseCloud.point_confidence attribute
- Added BuildModel.vertex_confidence, BuildModel.max_workgroup_size and BuildModel.workitem_size_cameras attributes
- Added BuildTexture.source_model and BuildTexture.texture_type attributes
- Added BuildUV.adaptive_resolution attribute
- Added DecimateModel.asset attribute
- Added ExportPanorama.image_compression attribute
- Added ExportPoints.save_classes and ExportPoints.save_confidence attributes
- Added ExportTexture.texture_type attribute
- Added ExportTiledModel.crs attribute
- Added ImportCameras.image_list and ImportCameras.load_image_list attributes
- Added ImportPoints.calculate_normals attribute

- Added MatchPhotos.guided_matching and MatchPhotos.reference_preselection_mode attributes
- Added MergeChunks.merge_depth_maps, MergeChunks.merge_elevations and MergeChunks.merge_orthomosaics attributes
- Added OptimizeCameras.fit_corrections attribute
- Added TriangulatePoints.max_error and TriangulatePoints.min_image attributes
- Added endpoints argument to PointCloud.pickPoint(), DenseCloud.pickPoint(), Model.pickPoint() and Tiled-Model.pickPoint() methods
- Added compression argument to Image.save() method
- Added cull_faces and add_alpha arguments to Model.renderDepth() method
- Added cull_faces, add_alpha and raster_transform arguments to Model.renderImage() method
- Added cull_faces argument to Model.renderMask() method
- Added cull_faces and add_alpha arguments to Model.renderNormalMap() method
- Moved TiffCompression enum to ImageCompression class
- Renamed Tasks.UndistortPhotos class to Tasks.ConvertImages
- Renamed Chunk.estimateImageQuality() method to Chunk.analyzePhotos()
- Renamed Chunk.buildPoints() method to Chunk.triangulatePoints()
- Renamed Chunk.loadReference() method to Chunk.importReference()
- Renamed Chunk.saveReference() method to Chunk.exportReference()
- Renamed Chunk.refineModel() method to Chunk.refineMesh()
- Renamed network_distribute tasks attribute to subdivide_task
- Renamed AlignChunks.align_method attribute to method
- Renamed AlignChunks.match_downscale attribute to downscale
- Renamed AlignChunks.match_filter_mask attribute to filter_mask
- Renamed AlignChunks.match_mask_tiepoints attribute to mask_tiepoints
- Renamed AlignChunks.match_point_limit attribute to keypoint_limit
- Renamed AlignChunks.match_select_pairs attribute to generic_preselection
- Renamed BuildDenseCloud.store_depth attribute to keep_depth
- Renamed BuildModel.store_depth attribute to keep_depth
- Renamed BuildOrthomosaic.ortho_surface attribute to surface_data
- Renamed BuildTiledModel.store_depth attribute to keep_depth
- Renamed BuildUV.texture_count attribute to page_count
- Renamed CalibrateColors.data_source attribute to source_data
- Renamed CalibrateColors.calibrate_color_balance attribute to white_balance
- Renamed ClassifyGroundPoints.cls_from attribute to source_class
- Renamed ClassifyPoints.cls_from attribute to source_class
- Renamed ClassifyPoints.cls_to attribute to target_classes
- Renamed DecimateModel.target_face_count attribute to face_count

- Renamed DuplicateChunk.copy_dense_cloud attribute to copy_dense_clouds
- Renamed ClassifyPoints.copy_elevation attribute to copy_elevations
- Renamed ClassifyPoints.copy_model attribute to copy_models
- Renamed ClassifyPoints.copy_orthomosaic attribute to copy_orthomosaics
- Renamed ClassifyPoints.copy_tiled_model attribute to copy_tiled_models
- Renamed ExportCameras.bingo_export_geoin attribute to bingo_save_geoin
- Renamed ExportCameras.bingo_export_gps attribute to bingo_save_gps
- Renamed ExportCameras.bingo_export_image attribute to bingo_save_image
- Renamed ExportCameras.bingo_export_itera attribute to bingo_save_itera
- Renamed ExportCameras.bundler_export_list attribute to bundler_save_list
- Renamed ExportCameras.chan_order_rotate attribute to chan_rotation_order
- Renamed ExportCameras.coordinates attribute to crs
- Renamed ExportCameras.export_markers attribute to save_markers
- Renamed ExportCameras.export_points attribute to save_points
- Renamed ExportMarkers.coordinates attribute to crs
- Renamed ExportModel.coordinates attribute to crs
- Renamed ExportModel.export_alpha attribute to save_alpha
- Renamed ExportModel.export_cameras attribute to save_cameras
- Renamed ExportModel.export_colors attribute to save_colors
- Renamed ExportModel.export_comment attribute to save_comment
- Renamed ExportModel.export_markers attribute to save_markers
- Renamed ExportModel.export_normals attribute to save_normals
- Renamed ExportModel.export_texture attribute to save_texture
- Renamed ExportModel.export_udim attribute to save_udim
- Renamed ExportModel.export_uv attribute to save_uv
- Renamed ExportOrthophotos.write_alpha attribute to save_alpha
- Renamed ExportOrthophotos.write_kml attribute to save_kml
- Renamed ExportOrthophotos.write_world attribute to save_world
- Renamed ExportPoints.coordinates attribute to crs
- Renamed ExportPoints.data_source attribute to source_data
- Renamed ExportPoints.export_colors attribute to save_colors
- Renamed ExportPoints.export_comment attribute to save_comment
- Renamed ExportPoints.export_images attribute to save_images
- Renamed ExportPoints.export_normals attribute to save_normals
- Renamed ExportPoints.tile_height attribute to block_height
- Renamed ExportPoints.tile_width attribute to block_width

- Renamed `ExportPoints.write_tiles` attribute to `split_in_blocks`
- Renamed `ExportRaster.data_source` attribute to `source_data`
- Renamed `ExportRaster.kmz_section_enable` attribute to `network_links`
- Renamed `ExportRaster.tile_width` attribute to `block_width`
- Renamed `ExportRaster.tile_height` attribute to `block_height`
- Renamed `ExportRaster.write_alpha` attribute to `save_alpha`
- Renamed `ExportRaster.write_kml` attribute to `save_kml`
- Renamed `ExportRaster.write_scheme` attribute to `save_scheme`
- Renamed `ExportRaster.write_tiles` attribute to `split_in_blocks`
- Renamed `ExportRaster.write_world` attribute to `save_world`
- Renamed `ExportRaster.xyz_level_min` attribute to `min_zoom_level`
- Renamed `ExportRaster.xyz_level_max` attribute to `max_zoom_level`
- Renamed `ExportShapes.coordinates` attribute to `crs`
- Renamed `ExportShapes.export_attributes` attribute to `save_attributes`
- Renamed `ExportShapes.export_labels` attribute to `save_labels`
- Renamed `ExportShapes.export_points` attribute to `save_points`
- Renamed `ExportShapes.export_polygons` attribute to `save_polygons`
- Renamed `ExportShapes.export_polylines` attribute to `save_polylines`
- Renamed `ExportTexture.write_alpha` attribute to `save_alpha`
- Renamed `ExportTiledModel.mesh_format` attribute to `model_format`
- Renamed `ImportMasks.method` attribute to `source`
- Renamed `ImportModel.coordinates` attribute to `crs`
- Renamed `ImportPoints.coordinates` attribute to `crs`
- Renamed `ImportReference.coordinates` attribute to `crs`
- Renamed `MatchPhotos.preselection_generic` attribute to `generic_preselection`
- Renamed `MatchPhotos.preselection_reference` attribute to `reference_preselection`
- Renamed `MatchPhotos.store_keypoints` attribute to `keep_keypoints`
- Renamed `RefineMesh.niterations` attribute to `iterations`
- Renamed `SmoothModel.apply_to_selected` attribute to `apply_to_selection`
- Renamed `TrackMarkers.frame_start` attribute to `first_frame`
- Renamed `TrackMarkers.frame_end` attribute to `last_frame`
- Renamed processing methods arguments to match task parameters names (e.g. `dx/dy` -> `resolution_x/resolution_y`, `write_xxx` -> `save_xxx`, `export_xxx` -> `save_xxx`, `import_xxx` -> `load_xxx`, `preselection_generic` -> `generic_preselection`, `preselection_reference` -> `reference_preselection`, `source_data` -> `data_source`, etc.)
- Replaced `Chunk.importDem()` method with `Chunk.importRaster()` method
- Replaced `Chunk.exportDem()` and `Chunk.exportOrthomosaic()` methods with `Chunk.exportRaster()` method

- Removed Accuracy and Quality enums
- Removed Model.texture() and Model.setTexture() methods
- Removed ExportPoints.precision attribute
- Removed OptimizeCameras.fit_p3 and OptimizeCameras.fit_p4 attributes
- Removed PlanMission.max_cameras and PlanMission.use_cameras attributes
- Removed tiff_big, tiff_tiled and tiff_overviews attributes from ExportOrthophotos and ExportRaster classes
- Removed tiff_compression attribute from ExportOrthophotos, ExportRaster and UndistortPhotos classes
- Removed jpeg_quality attribute from ExportOrthophotos, ExportRaster, ExportTiledModel and UndistortPhotos classes

3.34 Metashape version 1.5.5

No Python API changes

3.35 Metashape version 1.5.4

- Added Tasks.FilterDenseCloud class
- Added TiledModel.FaceCount enum
- Added copy() method to Antenna, Calibration, ChunkTransform, CirTransform, CoordinateSystem, Document, MetaData, OrthoProjection, RasterTransform, Region, Shutter, Target, Version, Viewpoint and Vignetting classes
- Added CameraTrack.save() and CameraTrack.load() methods
- Added Chunk.reduceOverlap() method
- Added location_enabled and rotation_enabled attributes to Sensor.Reference class
- Added CameraTrack.chunk and CameraTrack.meta attributes
- Added BuildTiledModel.ghosting_filter and BuildTiledModel.transfer_texture attributes
- Added ExportPoints.network_distribute and ExportPoints.region attributes
- Added ExportTiledModel.jpeg_quality and ExportTiledModel.texture_format attributes
- Added prevent_intersections argument to Chunk.buildContours() method
- Added transfer_texture argument to Chunk.buildTiledModel() method
- Added region argument to Chunk.exportPoints() method
- Added texture_format and jpeg_quality arguments to Chunk.exportTiledModel() method
- Added progress argument to Chunk.importMarkers() method
- Added ImageFormatWebP to ImageFormat enum

3.36 Metashape version 1.5.3

- Added DepthMap.getCalibration() and DepthMap.setCalibration() methods
- Added NetworkClient.dumpBatches(), NetworkClient.loadBatches() and NetworkClient.setBatchNodeLimit() methods
- Added location_enabled and rotation_enabled attributes to Camera.Reference class
- Added keep_depth argument to Chunk.buildTiledModel() method
- Added uv argument to Chunk.exportModel() method
- Added level argument to DepthMap.image() and DepthMap.setImage() methods
- Changed default value of keep_depth argument in Chunk.buildDenseCloud() and Chunk.buildModel() methods to True
- Changed default value of max_neighbors argument in Chunk.buildDenseCloud() method to 100

3.37 Metashape version 1.5.2

- Added CameraTrack class
- Added Tasks.PlanMission and Tasks.ReduceOverlap classes
- Added Camera.Type enum
- Added Chunk.addCameraTrack() method
- Added Application.title attribute
- Added Camera.type attribute
- Added Chunk.camera_track and Chunk.camera_tracks attributes
- Added BuildModel.trimming_radius attribute
- Added DetectMarkers.filter_mask attribute
- Added ImportReference.shutter_lag attribute
- Added Bundler and BINGO specific attributes to ExportCameras class
- Added supports_gpu attribute to task classes
- Added x, y, w, h arguments to Image.open() method
- Added filter_mask argument to Chunk.detectMarkers() method
- Added image_list argument to Chunk.importCameras() method
- Added shutter_lag argument to Chunk.loadReference() method
- Added ImageFormatBIL, ImageFormatXYZ, ImageFormatDDS to ImageFormat enum
- Removed Tasks.PlanMotion class
- Removed Animation class
- Removed Chunk.animation attribute
- Removed smoothness attribute from Tasks.BuildModel and Tasks.BuildTiledModel classes
- Removed quality and reuse_depth arguments from Chunk.buildModel() method

- Removed `downscale`, `filter_mode`, `max_neighbors`, `max_workgroup_size`, `network_distribute`, `reuse_depth`, `workitem_size_cameras` from `Tasks.BuildModel` class

3.38 Metashape version 1.5.1

- Added `License` class
- Added `Tasks.MergeAssets` class
- Added `Metashape.license` attribute
- Renamed `Tasks.OptimizeCoverage` class to `Tasks.PlanMotion`

3.39 Metashape version 1.5.0

- Added `Sensor.Reference` class
- Added `Tasks.ClassifyPoints` and `Tasks.OptimizeCoverage` classes
- Added `Data.Type` enum
- Added `Model.TextureType` enum
- Added `Tasks.TargetType` enum
- Added `Animation.Track.resize()` method
- Added `Chunk.findFrame()` method
- Added `DenseCloud.classifyPoints()` method
- Added `Document.findChunk()` method
- Added `Model.Faces.resize()`, `Model.Vertices.resize()` and `Model.TexVertices.resize()` methods
- Added `Tasks.createTask()` method
- Added `decode()`, `decodeJSON()`, `encodeJSON()` methods to task classes
- Added `Antenna.location_covariance` and `Antenna.rotation_covariance` attributes
- Added `Camera.calibration`, `Camera.location_covariance` and `Camera.rotation_covariance` attributes
- Added `Chunk.image_contrast` attribute
- Added `DenseCloud.bands` and `DenseCloud.data_type` attributes
- Added `Model.bands` and `Model.data_type` attributes
- Added `Elevation.palette` attribute
- Added `Model.Face.tex_index` attribute
- Added `Orthomosaic.bands` and `Orthomosaic.data_type` attributes
- Added `PointCloud.Point.cov` attribute
- Added `PointCloud.bands` and `PointCloud.data_type` attributes
- Added `Sensor.data_type`, `Sensor.film_camera`, `Sensor.location_covariance`, `Sensor.reference` and `Sensor.rotation_covariance` attributes
- Added `Sensor.fixed_params` and `Sensor.photo_params` attributes

- Added TiledModel.bands and TiledModel.data_type attributes
- Added AlignChunks.markers and AlignChunks.match_mask_tiepoints attributes
- Added BuildOrthomosaic.refine_seamlines attribute
- Added DetectMarkers.cameras and DetectMarkers.maximum_residual attributes
- Added ExportModel.colors_rgb_8bit and ExportPoints.colors_rgb_8bit attributes
- Added ExportOrthophotos.tiff_tiled and ExportRaster.tiff_tiled attributes
- Added OptimizeCameras.tiepoint_covariance attribute
- Added BuildModel.smoothness and BuildTiledModel.smoothness attributes
- Added target and workitem_count attributes to task classes
- Added max_workgroup_size and workitem_size_tiles attributes to Tasks.BuildDem class
- Added max_workgroup_size and workitem_size_cameras attributes to Tasks.BuildDenseCloud class
- Added max_workgroup_size and workitem_size_cameras attributes to Tasks.BuildDepthMaps class
- Added max_workgroup_size and workitem_size_cameras attributes to Tasks.BuildModel class
- Added max_workgroup_size, workitem_size_cameras and workitem_size_tiles attributes to Tasks.BuildOrthomosaic class
- Added max_workgroup_size, workitem_size_cameras and face_count attributes to Tasks.BuildTiledModel class
- Added max_workgroup_size, workitem_size_cameras and workitem_size_pairs attributes to Tasks.MatchPhotos class
- Added refine_seamlines argument to Chunk.buildOrthomosaic() method
- Added face_count argument to Chunk.buildTiledModel() method
- Added keypoints argument to Chunk.copy() method
- Added maximum_residual and cameras arguments to Chunk.detectMarkers() method
- Added tiff_tiled argument to Chunk.exportDem(), Chunk.exportOrthomosaic() and Chunk.exportOrthophotos() methods
- Added colors_rgb_8bit argument to Chunk.exportModel() and Chunk.exportPoints() methods
- Added tiepoint_covariance argument to Chunk.optimizeCameras() method
- Added confidence argument to DenseCloud.classifyPoints() method
- Added mask_tiepoints and markers arguments to Document.alignChunks() method
- Added ignore_lock argument to Document.open() method
- Added type argument to Model.setTexture() and Model.texture() methods
- Added workitem argument to Task.apply() method
- Added ModelFormatGLTF and ModelFormatX3D to ModelFormat enum
- Added Car and Manmade to PointClass enum
- Changed default value of filter argument in Chunk.buildDepthMaps() to MildFiltering
- Removed Tasks.BuildModel.visibility_mesh attribute

3.40 PhotoScan version 1.4.4

- Added AddPhotos.strip_extensions attribute
- Added ExportRaster.image_description attribute
- Added ExportShapes.export_attributes, ExportShapes.export_labels and ExportShapes.polygons_as_polylines attributes
- Added image_description argument to Chunk.exportDem() and Chunk.exportOrthomosaic() methods
- Added format, polygons_as_polylines, export_labels and export_attributes arguments to Chunk.exportShapes() method
- Added format argument to Chunk.importShapes() method
- Added RasterFormatTMS to RasterFormat enum

3.41 PhotoScan version 1.4.3

- Added Version class
- Added Tasks.DetectFiducials class
- Added Chunk.detectFiducials() method
- Added Sensor.calibrateFiducials() method
- Added CoordinateSystem.addGeoid() method
- Added PhotoScan.version attribute
- Added Sensor.normalize_to_float attribute
- Added minimum_dist attribute to Tasks.DetectMarkers class
- Added minimum_dist argument to Chunk.detectMarkers() and Utils.detectTargets() methods
- Added keypoints argument to PointCloud.copy() method
- Changed default value of adaptive_fitting argument in Chunk.alignCameras() to False

3.42 PhotoScan version 1.4.2

- Added Tasks.ColorizeDenseCloud class
- Added PointCloud.removeKeypoints() method
- Added CoordinateSystem.transformationMatrix() method
- Added Vector.cross() method
- Added Shapes.updateAltitudes() method
- Added log_enable, log_path, network_enable, network_host, network_path and network_port attributes to Application.Settings class
- Added covariance_matrix and covariance_params attributes to Calibration class
- Added flip_x, flip_y, flip_z attributes to Tasks.BuildDem and Tasks.BuildOrthomosaic classes

- Added `max_neighbors` attribute to `Tasks.BuildDenseCloud`, `Tasks.BuildDepthMaps` and `Tasks.BuildModel` classes
- Added `jpeg_quality`, `tiff_compression` and `update_gps_tags` attributes to `Tasks.UndistortPhotos` class
- Added `copy_keypoints` attribute to `Tasks.DuplicateChunk` class
- Added `width`, `height` and `world_transform` attributes to `Tasks.ExportRaster` class
- Added `store_depth` attribute to `Tasks.BuildTiledModel` class
- Added `DenseCloud.crs` and `DenseCloud.transform` attributes
- Added `CoordinateSystem.wkt2` attribute
- Added `keep_keypoints` argument to `Chunk.matchPhotos()` method
- Added `flip_x`, `flip_y`, `flip_z` arguments to `Chunk.buildDem()` and `Chunk.buildOrthomosaic()` methods
- Added `max_neighbors` argument to `Chunk.buildDenseCloud()` and `Chunk.buildDepthMaps()` methods
- Added `cull_faces` argument to `Chunk.buildOrthomosaic()` method
- Added `reuse_depth` and `ghosting_filter` arguments to `Chunk.buildTiledModel()` method
- Added `use_reflectance_panels` and `use_sun_sensor` arguments to `Chunk.calibrateReflectance()` method
- Added `width`, `height` and `world_transform` arguments to `Chunk.exportDem()` and `Chunk.exportOrthomosaic()` methods
- Added `filter_mask` argument to `Chunk.estimateImageQuality()` method
- Added `revision` argument to `NetworkClient.nodeList()` method
- Added `ImagesData` to `DataSource` enum
- Added `ModelFormatOSGB` to `ModelFormat` enum
- Added `TiledModelFormatOSGB` to `TiledModelFormat` enum

3.43 PhotoScan version 1.4.1

- Added `OrthoProjection.Type` enum
- Added `Camera.image()` method
- Added `Chunk.loadReflectancePanelCalibration()` method
- Added `PointCloud.Points.copy()` and `PointCloud.Points.resize()` methods
- Added `PointCloud.Projections.resize()` method
- Added `PointCloud.Tracks.copy()` and `PointCloud.Tracks.resize()` methods
- Added `OrthoProjection.matrix`, `OrthoProjection.radius` and `OrthoProjection.type` attributes
- Added `Tasks.AnalyzePhotos.filter_mask` attribute
- Added `Tasks.CalibrateReflectance.use_reflectance_panels` and `Tasks.CalibrateReflectance.use_sun_sensor` attributes
- Added `Tasks.MatchPhotos.mask_tiepoints` attribute
- Added `Tasks.OptimizeCameras.adaptive_fitting` attribute
- Added `strip_extensions` argument to `Chunk.addPhotos()` method

- Added `keep_depth` argument to `Chunk.buildDenseCloud()` method
- Added `adaptive_resolution` argument to `Chunk.buildUV()` method
- Added `alpha` argument to `Chunk.exportModel()` method
- Added `mask_tiepoints` argument to `Chunk.matchPhotos()` method
- Added `adaptive_fitting` argument to `Chunk.optimizeCameras()` method
- Added `mask` argument to `Utils.estimateImageQuality()` method
- Added `CamerasFormatABC` and `CamerasFormatFBX` to `CamerasFormat` enum
- Added `ImageFormatJP2` to `ImageFormat` enum
- Added `LegacyMapping` to `MappingMode` enum

3.44 PhotoScan version 1.4.0

- Added `Tasks` classes
- Added `Animation`, `OrthoProjection`, `Target` and `Vignetting` classes
- Added `ShapesFormat` enum
- Added `Marker.Type` enum
- Added `Chunk.calibrateColors()`, `Chunk.calibrateReflectance()` and `Chunk.locateReflectancePanels()` methods
- Added `Chunk.buildDepthMaps()`, `Chunk.importPoints()`, `Chunk.refineModel()` and `Chunk.removeLighting()` methods
- Added `Chunk.addDenseCloud()`, `Chunk.addDepthMaps()`, `Chunk.addElevation()`, `Chunk.addModel()`, `Chunk.addOrthomosaic()` and `Chunk.addTiledModel()` methods
- Added `Chunk.sortCameras()`, `Chunk.sortMarkers()` and `Chunk.sortScalebars()` methods
- Added `DenseCloud.clear()` method
- Added `DepthMaps.clear()` and `DepthMaps.copy()` methods
- Added `Elevation.clear()` and `Elevation.copy()` methods
- Added `Model.clear()` method
- Added `Orthomosaic.clear()` and `Orthomosaic.copy()` methods
- Added `TiledModel.clear()` and `TiledModel.copy()` methods
- Added `Image.gaussianBlur()` and `Image.uniformNoise()` methods
- Added `NetworkTask.encode()` method
- Added `Utils.createChessboardImage()` and `Utils.detectTargets()` methods
- Added `Camera.Reference.location_accuracy` and `Camera.Reference.rotation_accuracy` attributes
- Added `Camera.layer_index`, `Camera.master` and `Camera.vignetting` attributes
- Added `Chunk.dense_clouds`, `Chunk.depth_maps_sets`, `Chunk.elevations`, `Chunk.models`, `Chunk.orthomosaics` and `Chunk.tiled_models` attributes
- Added `Chunk.animation`, `Chunk.camera_crs`, `Chunk.marker_crs` and `Chunk.world_crs` attributes
- Added `CoordinateSystem.geoccs` and `CoordinateSystem.geoid_height` attributes

- Added Marker.Projection.valid attribute
- Added Sensor.black_level, Sensor.fiducials, Sensor.fixed_calibration, Sensor.fixed_location, Sensor.fixed_rotation, Sensor.layer_index, Sensor.location, Sensor.master, Sensor.normalize_sensitivity, Sensor.rolling_shutter, Sensor.rotation, Sensor.sensitivity and Sensor.vignetting attributes
- Added Camera.chunk, Marker.chunk, Scalebar.chunk and Sensor.chunk attributes
- Added Marker.sensor and Marker.type attributes
- Added Elevation.projection, Orthomosaic.projection and Shapes.projection attributes
- Added DenseCloud.key and DenseCloud.label attributes
- Added DepthMaps.key and DepthMaps.label attributes
- Added Elevation.key and Elevation.label attributes
- Added Model.key and Model.label attributes
- Added Orthomosaic.key and Orthomosaic.label attributes
- Added TiledModel.key and TiledModel.label attributes
- Added point_colors argument to Chunk.buildDenseCloud() method
- Added ghosting_filter argument to Chunk.buildTexture() method
- Added minimum_size argument to Chunk.detectMarkers() method
- Added raster_transform argument to Chunk.exportModel(), Chunk.exportPoints(), Chunk.exportTiledModel() methods
- Added tiff_overviews argument to Chunk.exportDem(), Chunk.exportOrthomosaic() and Chunk.exportOrthophotos() methods
- Added min_zoom_level and max_zoom_level arguments to Chunk.exportDem() and Chunk.exportOrthomosaic() methods
- Added cameras argument to Chunk.exportOrthophotos() method
- Added image_format argument to Chunk.exportPoints() method
- Added page_numbers argument to Chunk.exportReport() method
- Added items, crs, ignore_labels, threshold and progress arguments to Chunk.loadReference() method
- Added create_markers argument to Chunk.loadReference() method
- Added progress argument to Chunk.saveReference() method
- Added quality, volumetric_masks, keep_depth and reuse_depth arguments to Chunk.buildModel() method
- Added selected_faces and fix_borders arguments to Chunk.smoothModel() method
- Added export_points, export_markers, use_labels and progress arguments to Chunk.exportCameras() method
- Added channels and datatype arguments to Photo.image() method
- Added CamerasFormatBlocksExchange and CamerasFormatORIMA to CamerasFormat enum
- Added ImageFormatNone to ImageFormat enum
- Added UndefinedLayout to ImageLayout enum
- Added ModelFormatNone and ModelFormatABC to ModelFormat enum
- Added PointsFormatNone and PointsFormatCesium to PointsFormat enum
- Added RasterFormatNone to RasterFormat enum

- Added ReferenceFormatNone and ReferenceFormatAPM to ReferenceFormat enum
- Added TiledModelFormatNone, TiledModelFormatCesium and TiledModelFormatSLPK to TiledModelFormat enum
- Renamed Chunk.master_channel attribute to Chunk.primary_channel
- Removed MatchesFormat enum
- Removed Chunk.exportMatches() method
- Removed Camera.Reference.accuracy_ypr attribute
- Removed quality, filter, cameras, keep_depth, reuse_depth arguments from Chunk.buildDenseCloud() method
- Removed color_correction argument from Chunk.buildOrthomosaic() and Chunk.buildTexture() methods
- Removed fit_shutter argument from Chunk.optimizeCameras() method

3.45 PhotoScan version 1.3.5

No Python API changes

3.46 PhotoScan version 1.3.4

No Python API changes

3.47 PhotoScan version 1.3.3

- Added network_links argument to Chunk.exportDem() and Chunk.exportOrthomosaic() methods
- Added read_only argument to Document.open() method
- Added NetworkClient.setNodeCPUEnable() and NetworkClient.setNodeGPUMask() methods
- Added Chunk.modified, DenseCloud.modified, DepthMaps.modified, Document.modified, Elevation.modified, Masks.modified, Model.modified, Orthomosaic.modified, PointCloud.modified, Shapes.modified, Thumbnails.modified, TiledModel.modified attributes
- Added Document.read_only attribute
- Added CamerasFormatSummit to CamerasFormat enum

3.48 PhotoScan version 1.3.2

- Added vertex_colors argument to Chunk.buildModel() method
- Added Shape.vertex_ids attribute

3.49 PhotoScan version 1.3.1

- Added Settings and TiledModel classes
- Added Application.getBool() method
- Added Camera.unproject() method
- Added Chunk.addFrames(), Chunk.addMarkerGroup(), Chunk.addScalebarGroup() and Chunk.buildSeamlines() methods
- Added DenseCloud.pickPoint() and DenseCloud.updateStatistics() methods
- Added Elevation.altitude() method
- Added Matrix.svd() method
- Added Model.pickPoint() method
- Added Orthomosaic.reset() and Orthomosaic.update() methods
- Added PointCloud.pickPoint() method
- Added filter argument to Application.getOpenFileName(), Application.getOpenFileNames() and Application.getSaveFileName() methods
- Added point and visibility arguments to Chunk.addMarker() method
- Added raster_transform and write_scheme arguments to Chunk.exportDem() method
- Added write_scheme and white_background arguments to Chunk.exportOrthomosaic() method
- Added white_background argument to Chunk.exportOrthophotos() method
- Added projection argument to Chunk.exportMarkers() method
- Added markers argument to Chunk.exportModel() method
- Added pairs argument to Chunk.matchPhotos() method
- Added columns and delimiter arguments to Chunk.saveReference() method
- Added version argument to Document.save() method
- Renamed npasses argument in Chunk.smoothModel() method to strength and changed its type to float
- Renamed from and to arguments in CoordinateSystem.transform(), DenseCloud.assignClass(), DenseCloud.assignClassToSelection() and DenseCloud.classifyGroundPoints() methods to avoid collision with reserved words
- Added Application.settings attribute
- Added Chunk.tiled_model attribute
- Added ShapeGroup.color and ShapeGroup.show_labels attributes
- Added ImageFormatTGA to ImageFormat enum

3.50 PhotoScan version 1.3.0

- Added MarkerGroup, Masks, ScalebarGroup, Shutter and Thumbnails classes
- Added Application.PhotosPane class
- Added Model.Statistics class
- Added Orthomosaic.Patch and Orthomosaic.Patches classes
- Added PointCloud.Filter class
- Added CamerasFormat, EulerAngles, ImageFormat, ImageLayout, MaskOperation, MaskSource, MatchesFormat, ModelFormat, ModelViewMode, PointClass, PointsFormat, RasterFormat, ReferenceFormat, ReferenceItems, RotationOrder, TiffCompression, TiledModelFormat enums
- Added Application.captureOrthoView() method
- Added Chunk.refineMarkers() method
- Added CoordinateSystem.listBuiltinCRS() class method
- Added Matrix.translation() method
- Added Model.statistics() method
- Added NetworkClient.serverInfo(), NetworkClient.nodeStatus(), NetworkClient.setNodeCapability() and NetworkClient.quitNode() methods
- Added Photo.imageMeta() method
- Added Shape.area(), Shape.perimeter2D(), Shape.perimeter3D() and Shape.volume() methods
- Added Utils.createMarkers() method
- Added source argument to Application.captureModelView() method
- Added image_format argument to Chunk.exportDem() method
- Added write_alpha argument to Chunk.exportOrthophotos() method
- Added image_format and write_alpha arguments to Chunk.exportOrthomosaic() method
- Added groups, projection, shift and progress arguments to Chunk.exportShapes() method
- Added items and progress arguments to Chunk.copy() method
- Added sensor argument to Chunk.addCamera() method
- Added layout argument to Chunk.addPhotos() method
- Added jpeg_quality argument to Chunk.exportOrthomosaic() and Chunk.exportOrthophotos() methods
- Added fill_holes argument to Chunk.buildOrthomosaic() method
- Added fit_shutter argument to Chunk.optimizeCameras() method
- Added settings argument to Chunk.exportReport() method
- Added progress argument to various DenseCloud methods
- Added from argument to DenseCloud.classifyGroundPoints() method
- Added chunks and progress arguments to Document.append() method
- Added progress argument to Document.alignChunks() and Document.mergeChunks() methods
- Added revision argument to NetworkClient.batchList(), NetworkClient.batchStatus() methods

- Added `Application.photos_pane` attribute
- Added `Camera.shutter` attribute
- Added `Chunk.masks` and `Chunk.thumbnails` attributes
- Added `Chunk.marker_groups` and `Chunk.scalebar_groups` attributes
- Added `Chunk.euler_angles` and `Chunk.scalebar_accuracy` attributes
- Added `CoordinateSystem.name` attribute
- Added `Marker.group` and `Scalebar.group` attributes
- Added `Orthomosaic.patches` attribute
- Added `RasterTransform.false_color` attribute
- Added `Sensor.bands` attribute
- Added `Shape.attributes` attribute
- Added `DepthMapsData`, `TiledModelData` and `OrthomosaicData` to `DataSource` enum
- Added `CircularTarget14bit` to `TargetType` enum
- Renamed `CameraReference` class to `Camera.Reference`
- Renamed `ConsolePane` class to `Application.ConsolePane`
- Renamed `MarkerProjection` class to `Marker.Projection`
- Renamed `MarkerProjections` class to `Marker.Projections`
- Renamed `MarkerReference` class to `Marker.Reference`
- Renamed `MeshFace` class to `Model.Face`
- Renamed `MeshFaces` class to `Model.Faces`
- Renamed `MeshTexVertex` class to `Model.TexVertex`
- Renamed `MeshTexVertices` class to `Model.TexVertices`
- Renamed `MeshVertex` class to `Model.Vertex`
- Renamed `MeshVertices` class to `Model.Vertices`
- Renamed `PointCloudCameras` class to `PointCloud.Cameras`
- Renamed `PointCloudPoint` class to `PointCloud.Point`
- Renamed `PointCloudPoints` class to `PointCloud.Points`
- Renamed `PointCloudProjection` class to `PointCloud.Projection`
- Renamed `PointCloudProjections` class to `PointCloud.Projections`
- Renamed `PointCloudTrack` class to `PointCloud.Track`
- Renamed `PointCloudTracks` class to `PointCloud.Tracks`
- Renamed `ScalebarReference` class to `Scalebar.Reference`
- Renamed `ShapeVertices` class to `Shape.Vertices`
- Renamed `Application.enumOpenCLDevices()` method to `Application.enumGPUDevices()`
- Renamed `Shape.boundary` attribute to `Shape.boundary_type`
- Renamed `Chunk.accuracy_cameras` to `Chunk.camera_location_accuracy`

- Renamed `Chunk.accuracy_cameras_ypr` to `Chunk.camera_rotation_accuracy`
- Renamed `Chunk.accuracy_markers` to `Chunk.marker_location_accuracy`
- Renamed `Chunk.accuracy_projections` to `Chunk.marker_projection_accuracy`
- Renamed `Chunk.accuracy_tiepoints` to `Chunk.tiepoint_accuracy`
- Renamed method argument in `Chunk.importMasks()` method to `source` and changed its type to `MaskSource`
- Replaced `preselection` argument with `generic_preselection` and `reference_preselection` arguments in `Chunk.matchPhotos()` method
- Replaced `fit_cxcy` argument with `fit_cx` and `fit_cy` arguments in `Chunk.optimizeCameras()` method
- Replaced `fit_k1k2k3` argument with `fit_k1`, `fit_k2` and `fit_k3` arguments in `Chunk.optimizeCameras()` method
- Replaced `fit_p1p2` argument with `fit_p1` and `fit_p2` arguments in `Chunk.optimizeCameras()` method
- Replaced `Application.cpu_cores_inactive` with `Application.cpu_enable` attribute
- Changed type of `source_data` argument in `Chunk.buildContours()` to `DataSource`
- Changed type of `format` argument in `Chunk.importCameras()` and `Chunk.exportCameras()` methods to `Cameras-Format`
- Changed type of `rotation_order` argument in `Chunk.exportCameras()` to `RotationOrder`
- Changed type of `format` argument in `Chunk.exportDem()` and `Chunk.exportOrthomosaic()` methods to `Raster-Format`
- Changed type of `format` argument in `Chunk.exportMatches()` method to `MatchesFormat`
- Changed type of `texture_format` argument in `Chunk.exportModel()` method to `ImageFormat`
- Changed type of `format` argument in `Chunk.importModel()` and `Chunk.exportModel()` methods to `ModelFormat`
- Changed type of `format` argument in `Chunk.exportPoints()` method to `PointsFormat`
- Changed type of `tiff_compression` argument in `Chunk.exportOrthomosaic()` and `Chunk.exportOrthophotos()` methods to `TiffCompression`
- Changed type of `items` argument in `Chunk.exportShapes()` method to `Shape.Type`
- Changed type of `format` argument in `Chunk.exportTiledModel()` method to `TiledModelFormat`
- Changed type of `mesh_format` argument in `Chunk.exportTiledModel()` method to `ModelFormat`
- Changed type of `operation` argument in `Chunk.importMasks()` method to `MaskOperation`
- Changed type of `format` argument in `Chunk.loadReference()` and `Chunk.saveReference()` methods to `Reference-Format`
- Changed type of `items` argument in `Chunk.saveReference()` method to `ReferenceItems`
- Removed return values from `Camera.open()`, `Chunk.addPhotos()`, `Chunk.alignCameras()`, `Chunk.buildContours()`, `Chunk.buildDem()`, `Chunk.buildDenseCloud()`, `Chunk.buildModel()`, `Chunk.buildOrthomosaic()`, `Chunk.buildPoints()`, `Chunk.buildTexture()`, `Chunk.buildTiledModel()`, `Chunk.buildUV()`, `Chunk.decimateModel()`, `Chunk.detectMarkers()`, `Chunk.estimateImageQuality()`, `Chunk.exportCameras()`, `Chunk.exportDem()`, `Chunk.exportMarkers()`, `Chunk.exportMatches()`, `Chunk.exportModel()`, `Chunk.exportOrthomosaic()`, `Chunk.exportOrthophotos()`, `Chunk.exportPoints()`, `Chunk.exportReport()`, `Chunk.exportShapes()`, `Chunk.exportTiledModel()`, `Chunk.importCameras()`, `Chunk.importDem()`, `Chunk.importMarkers()`, `Chunk.importMasks()`, `Chunk.importModel()`, `Chunk.importShapes()`, `Chunk.loadReference()`, `Chunk.loadReferenceExif()`, `Chunk.matchPhotos()`, `Chunk.optimizeCameras()`, `Chunk.remove()`, `Chunk.saveReference()`, `Chunk.smoothModel()`, `Chunk.thinPointCloud()`, `Chunk.trackMarkers()`, `CirTransform.calibrate()`, `CoordinateSystem.init()`

DenseCloud.classifyGroundPoints(), DenseCloud.compactPoints(), DenseCloud.selectMaskedPoints(), DenseCloud.selectPointsByColor(), Document.alignChunks(), Document.append(), Document.clear(), Document.mergeChunks(), Document.open(), Document.remove(), Document.save(), Mask.load(), Model.closeHoles(), Model.fixTopology(), Model.loadTexture(), Model.removeComponents(), Model.saveTexture(), Model.setTexture(), NetworkClient.abortBatch(), NetworkClient.abortNode(), NetworkClient.connect(), NetworkClient.pauseBatch(), NetworkClient.pauseNode(), NetworkClient.resumeBatch(), NetworkClient.resumeNode(), NetworkClient.setBatchPriority(), NetworkClient.setNodePriority(), Photo.open(), PointCloud.export(), RasterTransform.calibrateRange(), Thumbnail.load() methods in favor of exceptions

- Removed Chunk.exportContours() method
- Removed obsolete Matrix.diag() and Matrix.translation() class methods
- Removed unused focal_length argument from Calibration.save() method
- Modified Utils.mat2opk() and Utils.opk2mat() methods to work with camera to world rotation matrices

3.51 PhotoScan version 1.2.6

No Python API changes

3.52 PhotoScan version 1.2.5

- Added ShapeGroup and ShapeVertices classes
- Added CoordinateSystem.proj4 and CoordinateSystem.geogcs attributes
- Added Shapes.shapes and Shapes.groups attributes
- Added Shape.label, Shape.vertices, Shape.group, Shape.has_z, Shape.key and Shape.selected attributes
- Added Shapes.addGroup(), Shapes.addShape() and Shapes.remove() methods
- Added CoordinateSystem.transform() method
- Added Matrix.Diag(), Matrix.Rotation(), Matrix.Translation() and Matrix.Scale() class methods
- Added Matrix.rotation() and Matrix.scale() methods
- Added DenseCloud.restorePoints() and DenseCloud.selectPointsByColor() methods
- Added Application.captureModelView() method
- Added Mask.invert() method
- Added adaptive_fitting parameter to Chunk.alignCameras() method
- Added load_rotation and load_accuracy parameters to Chunk.loadReferenceExif() method
- Added source parameter to Chunk.buildTiledModel() method
- Added fill_holes parameter to Chunk.buildTexture() method

3.53 PhotoScan version 1.2.4

- Added NetworkClient and NetworkTask classes
- Added Calibration.f, Calibration.b1, Calibration.b2 attributes
- Added Chunk.exportMatches() method
- Added DenseCloud.compactPoints() method
- Added Orthomosaic.removeOrthophotos() method
- Added fit_b1 and fit_b2 parameters to Chunk.optimizeCameras() method
- Added tiff_big parameter to Chunk.exportOrthomosaic(), Chunk.exportDem() and Chunk.exportOrthophotos() methods
- Added classes parameter to Chunk.exportPoints() method
- Added progress parameter to processing methods
- Removed Calibration.fx, Calibration.fy, Calibration.skew attributes

3.54 PhotoScan version 1.2.3

- Added tiff_compression parameter to Chunk.exportOrthomosaic() and Chunk.exportOrthophotos() methods

3.55 PhotoScan version 1.2.2

- Added Camera.orientation attribute
- Added chunks parameter to Document.save() method

3.56 PhotoScan version 1.2.1

- Added CirTransform and RasterTransform classes
- Added Chunk.cir_transform and Chunk.raster_transform attributes
- Added Chunk.exportOrthophotos() method
- Added udim parameter to Chunk.exportModel() method
- Renamed RasterTransform enum to RasterTransformType

3.57 PhotoScan version 1.2.0

- Added Elevation and Orthomosaic classes
- Added Shape and Shapes classes
- Added Antenna class
- Added DataSource enum
- Added Camera.error() method
- Added Chunk.buildContours() and Chunk.exportContours() methods
- Added Chunk.importShapes() and Chunk.exportShapes() methods
- Added Chunk.exportMarkers() and Chunk.importMarkers() methods
- Added Chunk.importDem() method
- Added Chunk.buildDem(), Chunk.buildOrthomosaic() and Chunk.buildTiledModel() methods
- Added PointCloud.removeSelectedPoints() and PointCloud.cropSelectedPoints() methods
- Added Utils.mat2opk(), Utils.mat2ypr(), Utils.opk2mat() and Utils.ypr2mat() methods
- Added Chunk.elevation, Chunk.orthomosaic and Chunk.shapes attributes
- Added Chunk.accuracy_cameras_ypr attribute
- Added Sensor.antenna, Sensor.plane_count and Sensor.planes attributes
- Added Calibration.p3 and Calibration.p4 attributes
- Added Camera.planes attribute
- Added CameraReference.accuracy_ypr attribute
- Added CameraReference.accuracy, MarkerReference.accuracy and ScalebarReference.accuracy attributes
- Added Application.activated attribute
- Added Chunk.image_brightness attribute
- Added fit_p3 and fit_p4 parameters to Chunk.optimizeCameras() method
- Added icon parameter to Application.addMenuItem() method
- Added title and description parameters to Chunk.exportReport() method
- Added operation parameter to Chunk.importMasks() method
- Added columns, delimiter, group_delimiters, skip_rows parameters to Chunk.loadReference() method
- Added items parameter to Chunk.saveReference() method
- Renamed Chunk.exportModelTiled() to Chunk.exportTiledModel()
- Renamed Chunk.exportOrthophoto() to Chunk.exportOrthomosaic()
- Removed OrthoSurface and PointsSource enums
- Removed PointCloud.groups attribute
- Removed Chunk.camera_offset attribute

3.58 PhotoScan version 1.1.1

- Added `Chunk.exportModelTiles()` method
- Added `noparity` parameter to `Chunk.detectMarkers()` method
- Added `blockw` and `blockh` parameters to `Chunk.exportPoints()` method

3.59 PhotoScan version 1.1.0

- Added `CameraOffset` and `ConsolePane` classes
- Added `CameraGroup`, `CameraReference`, `ChunkTransform`, `DepthMap`, `DepthMaps`, `MarkerReference`, `MarkerProjection`, `Mask`, `PointCloudGroups`, `PointCloudTrack`, `PointCloudTracks`, `ScalebarReference`, `Thumbnail` classes
- Added `Chunk.key`, `Sensor.key`, `Camera.key`, `Marker.key` and `Scalebar.key` attributes
- Added `Application.console` attribute
- Added `Application.addMenuSeparator()` method
- Added `Chunk.importMasks()` method
- Added `Chunk.addSensor()`, `Chunk.addCameraGroup()`, `Chunk.addCamera()`, `Chunk.addMarker()`, `Chunk.addScalebar()` methods
- Added `Chunk.addPhotos()`, `Chunk.addFrame()` methods
- Added `Chunk.master_channel` and `Chunk.camera_offset` attributes
- Added `Calibration.error()` method
- Added `Matrix.mulp()` and `Matrix.mulv()` methods
- Added `DenseCloud.assignClass()`, `DenseCloud.assignClassToSelection()`, `DenseCloud.removePoints()` methods
- Added `DenseCloud.classifyGroundPoints()` and `DenseCloud.selectMaskedPoints()` methods
- Added `Model.renderNormalMap()` method
- Added `DenseCloud.meta` and `Model.meta` attributes
- Added `PointCloud.tracks`, `PointCloud.groups` attributes
- Added `Image.tostring()` and `Image.fromstring()` methods
- Added `Image.channels` property
- Added U16 data type support in `Image` class
- Added `classes` parameter to `Chunk.buildModel()` method
- Added `crop_borders` parameter to `Chunk.exportDem()` method
- Added `chunk` parameter to `Document.addChunk()` method
- Added `format` parameter to `Calibration.save()` and `Calibration.load()` methods
- Moved OpenCL settings into `Application` class
- Converted string constants to enum objects
- Removed `Cameras`, `Chunks`, `DenseClouds`, `Frame`, `Frames`, `GroundControl`, `GroundControlLocations`, `GroundControlLocation`, `Markers`, `MarkerPositions`, `Models`, `Scalebars`, `Sensors` classes

3.60 PhotoScan version 1.0.0

- Added DenseCloud and DenseClouds classes
- Added Chunk.exportModel() and Chunk.importModel() methods
- Added Chunk.estimateImageQuality() method
- Added Chunk.buildDenseCloud() and Chunk.smoothModel() methods
- Added Photo.thumbnail() method
- Added Image.resize() method
- Added Application.enumOpenCLDevices() method
- Added Utils.estimateImageQuality() method
- Added Camera.meta, Marker.meta, Scalebar.meta and Photo.meta attributes
- Added Chunk.dense_cloud and Chunk.dense_clouds attributes
- Added page parameter to Model.setTexture() and Model.texture() methods
- Added shortcut parameter to Application.addItem() method
- Added absolute_paths parameter to Document.save() method
- Added fit_f, fit_cxycy, fit_k1k2k3 and fit_k4 parameters to Chunk.optimizePhotos() method
- Changed parameters of Chunk.buildModel() and Chunk.buildTexture() methods
- Changed parameters of Chunk.exportPoints() method
- Changed parameters of Model.save() method
- Changed return value of Chunks.add() method
- Removed Chunk.buildDepth() method
- Removed Camera.depth() and Camera.setDepth() methods
- Removed Frame.depth() and Frame.setDepth() methods
- Removed Frame.depth_calib attribute

3.61 PhotoScan version 0.9.1

- Added Sensor, Scalebar and MetaData classes
- Added Camera.sensor attribute
- Added Chunk.sensors attribute
- Added Calibration.width, Calibration.height and Calibration.k4 attributes
- Added Chunk.refineMatches() method
- Added Model.area() and Model.volume() methods
- Added Model.renderDepth(), Model.renderImage() and Model.renderMask() methods
- Added Chunk.meta and Document.meta attributes
- Added Calibration.project() and Calibration.unproject() methods
- Added Application.addItem() method

- Added `Model.closeHoles()` and `Model.fixTopology()` methods

3.62 PhotoScan version 0.9.0

- Added `Camera`, `Frame` and `CoordinateSystem` classes
- Added `Chunk.exportReport()` method
- Added `Chunk.trackMarkers()` and `Chunk.detectMarkers()` methods
- Added `Chunk.extractFrames()` and `Chunk.removeFrames()` methods
- Added `Chunk.matchPhotos()` method
- Added `Chunk.buildDepth()` and `Chunk.resetDepth()` methods
- Added `Chunk.cameras` property
- Added `Utils.createDifferenceMask()` method
- Revised `Chunk.alignPhotos()` method
- Revised `Chunk.buildPoints()` method
- Revised `Chunk.buildModel()` method
- Removed `Photo` class (deprecated)
- Removed `GeoProjection` class (deprecated)
- Removed `Chunk.photos` property (deprecated)

3.63 PhotoScan version 0.8.5

- Added `Chunk.fix_calibration` property
- Added `Chunk.exportCameras()` method
- Added `Chunk.exportPoints()` method for dense/sparse point cloud export
- Added `accuracy_cameras`, `accuracy_markers` and `accuracy_projections` properties to the `GroundControl` class
- Added `Image.undistort()` method
- Added `PointCloudPoint.selected` and `PointCloudPoint.valid` properties
- Added `GeoProjection.authority` property
- Added `GeoProjection.init()` method
- Moved `GroundControl.optimize()` method to `Chunk.optimize()`
- Removed “`fix_calibration`” parameter from `Chunk.alignPhotos()` method
- Removed `GeoProjection.epsg` property

3.64 PhotoScan version 0.8.4

- Added GroundControl.optimize() method
- Command line scripting support removed

3.65 PhotoScan version 0.8.3

Initial version of PhotoScan Python API

PYTHON MODULE INDEX

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Metashape, 5