Tutorial (Intermediate level): Coded Targets & Scale Bars in Agisoft PhotoScan Pro 1.1

This tutorial shows how coded targets can be used in PhotoScan Professional for coordinate system or scale definition. Also the main principles of scale bars usage are described.

Overview

Coded targets are printed markers that can be placed in the scene before photos are taken and could be used in PhotoScan Professional as reference points for coordinate system and scale definition or as a valid matches between images to help camera alignment procedure via "Align Selected Cameras" option.

How to Print Coded Targets

Select *Print Markers...* command in the *Tools → Markers* menu:
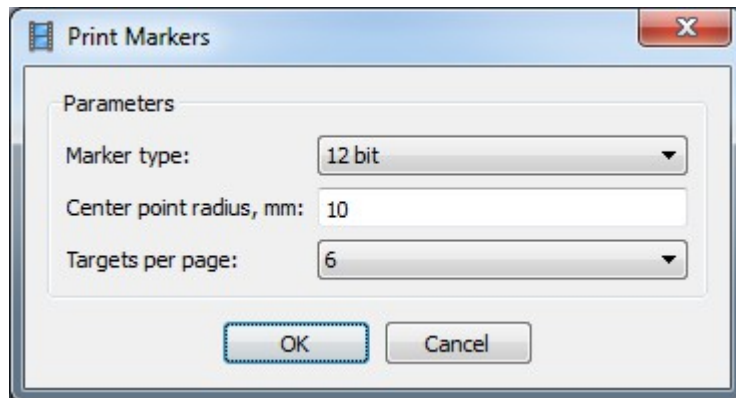
The selected parameters will be used for PDF file generation in the *Print Markers* dialog.

Recommended settings for marker printing are the following:
Marker type: *12 bit*
Center point radius, mm: *10*
Targets per page, mm*: 6*

Click *OK* and in the opened *Save As* dialog specify the folder for PDF file to be saved in.

Exported PDF file will contain all the possible coded targets and it is not necessary to print all the pages. Select few pages (depending on the number of targets to be placed) from the middle of the document and send them to the printer.
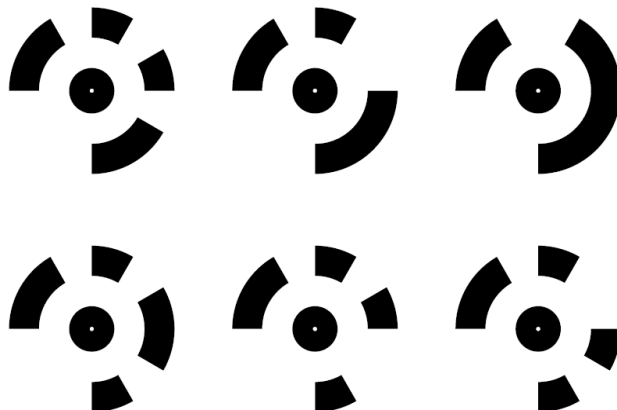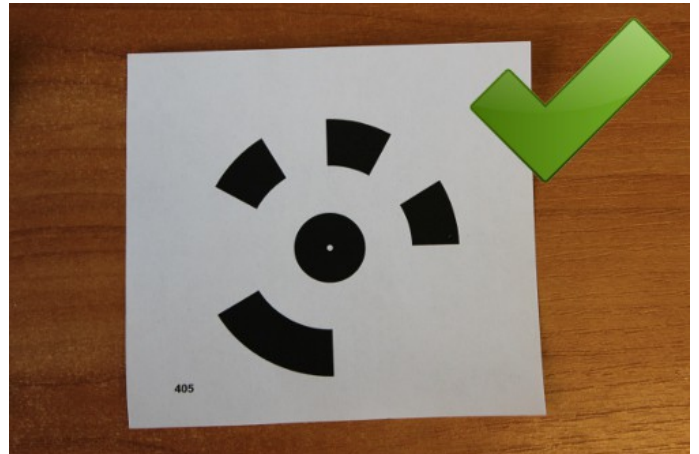
How to Place Coded Targets in Scene and Take Photos

Coded targets should be flat, any deformations should be avoided.
Coded targets should be circles with black and white segments, so you have to cut them keeping in mind circle dimensions.
Any changes in the coded target pattern must be avoided.

Once the coded targets are printed, place them in the scene or around the object of interest so that they could be clearly seen from at least of couple or images.

Note that the size of the coded targets should not be too big or too small compared to the object or scene. It is recommended that the size of central black circle-point on the taken photo is not greater than 30 pix.

How to Detect Coded Targets Automatically

Select *Detect Markers...* command in the *Tools* menu:
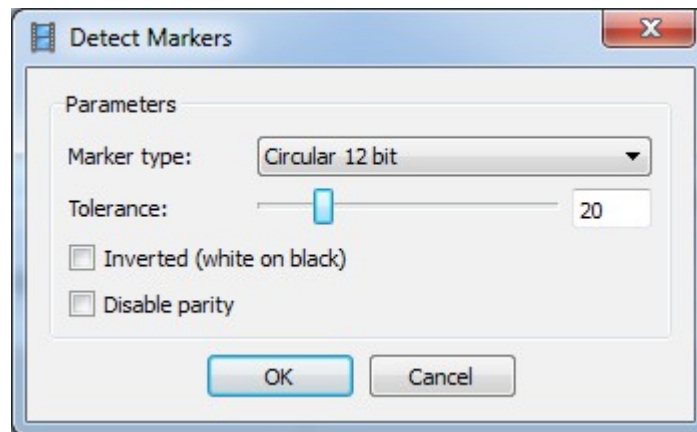
In the *Detect Markers* dialog choose corresponding *Marker Type* and adjust *Tolerance* value. Click *OK* and wait until marker detection procedure is finished.

Tip: PhotoScan Pro supports automatic detection of 12-, 16- and 20- bit coded targets. Also Cross and Circle non-coded targets are supported (see examples below), but non-coded target detection is only possible after camera alignment is finished (see the examples of non-coded cross and circular targets below).
Inverted flag can be used to detect white targets on the black background.
Parity check is applicable for coded targets only and means that targets can have only even number of black sectors.
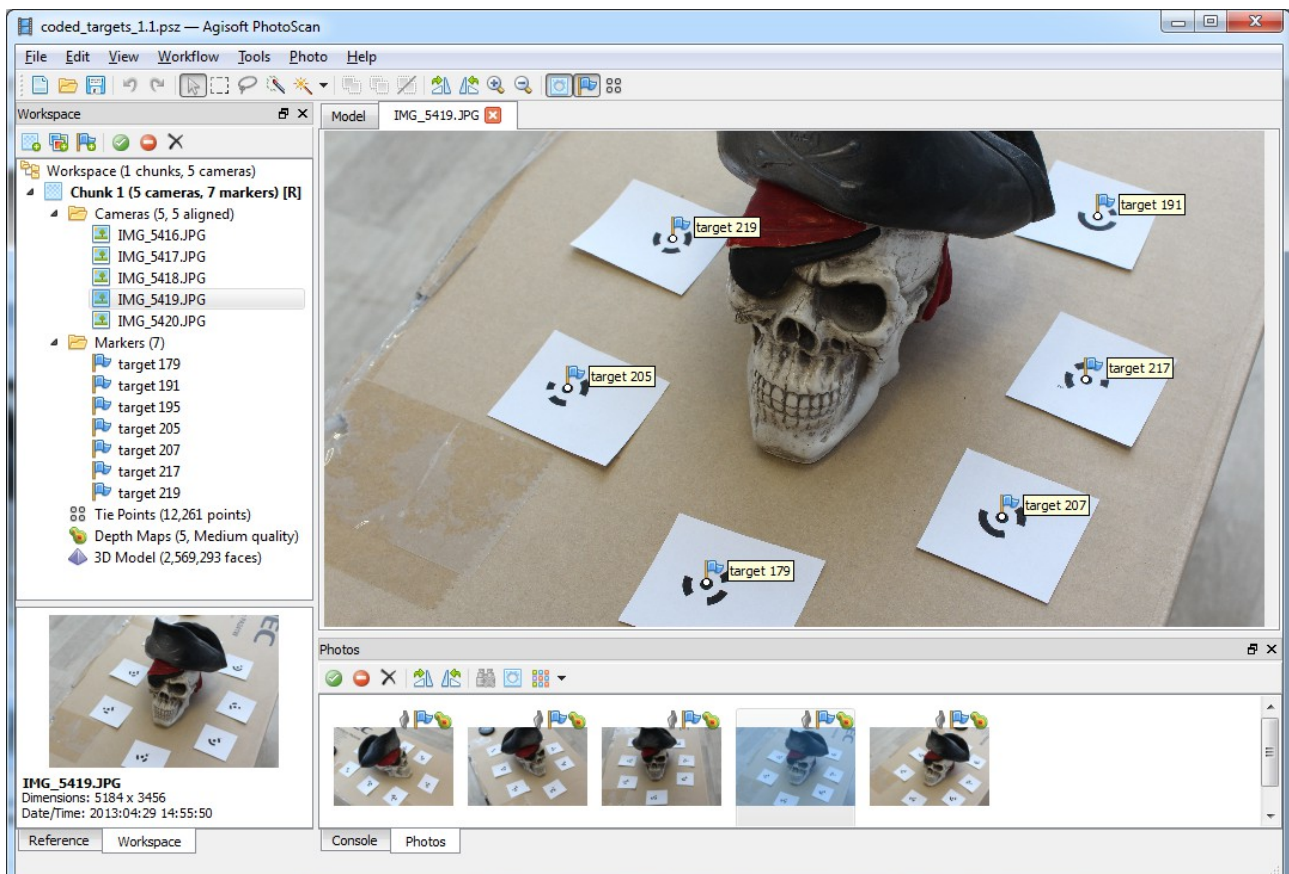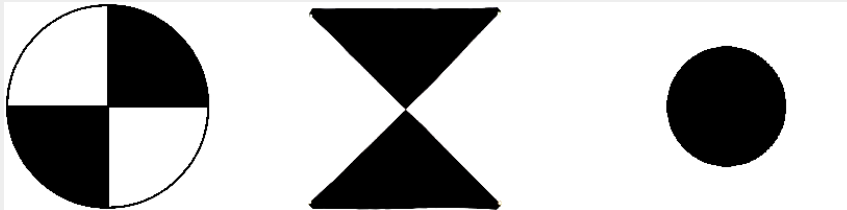
Detected markers will be named correspondingly to the coded targets labels.

# How to Create Scale Bar and Set Up Reference Distance

Providing that before or after the shooting session some of the linear distances between the coded targets have been measured, it is possible to set up the scale of the model using this information.

Actually, coded targets detection could be performed even after the model has been processed. So in case the camera position have not been estimated yet, proceed to *Align Photos* procedure.

Once the photos are aligned you can see the markers in the *Model* view:
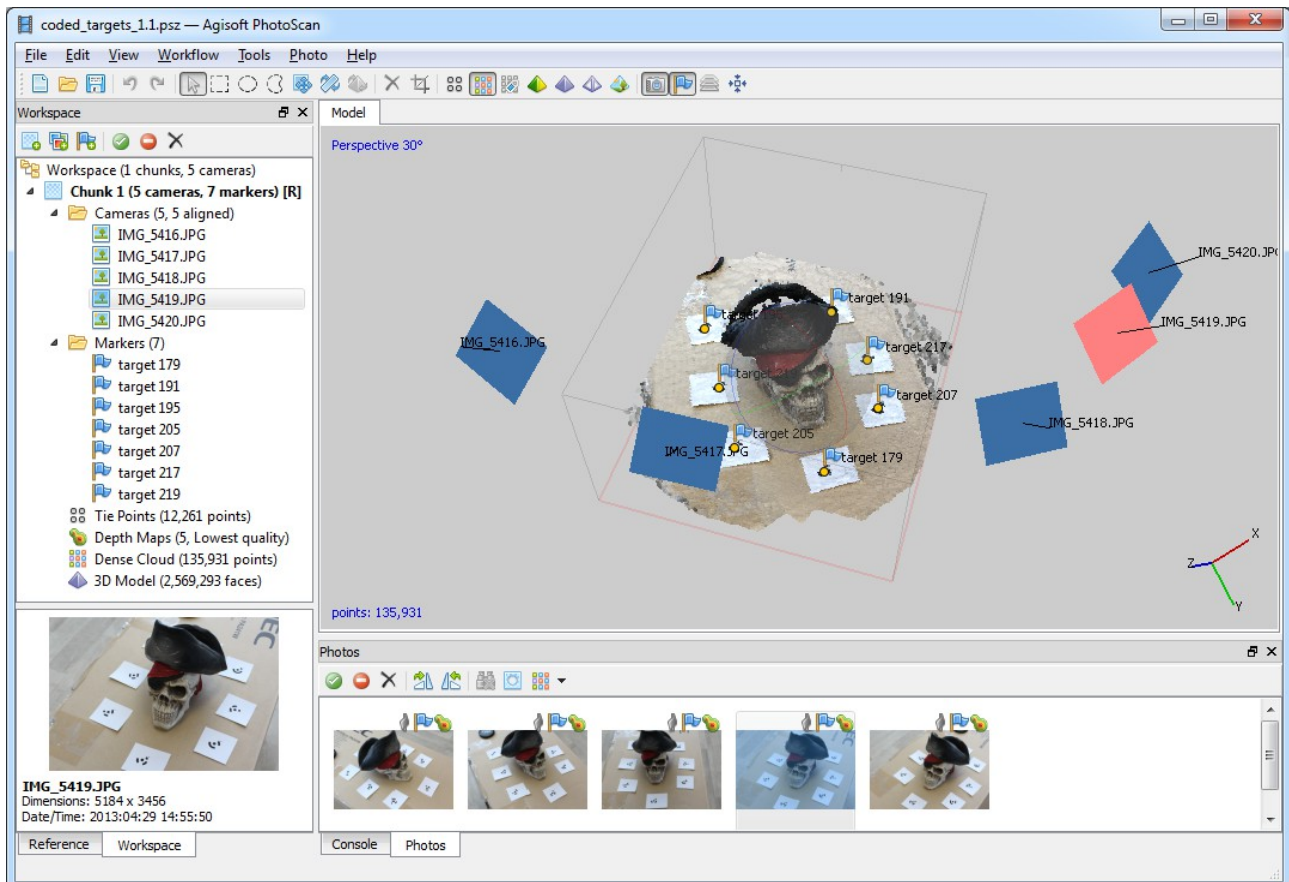
To create a scale bar consequently left-click on the markers in the *Model* view (with any selection tool active, while holding the Ctrl key), that correspond to the scale bar ends. Then right-click in the model view or on the pair of selected markers in the *Workspace* pane to open the context menu and select *Create Scale Bar* option. Repeat for every pair of markers with know distance between them.
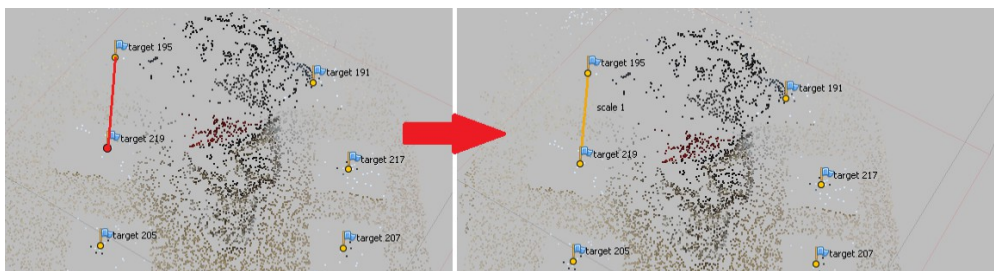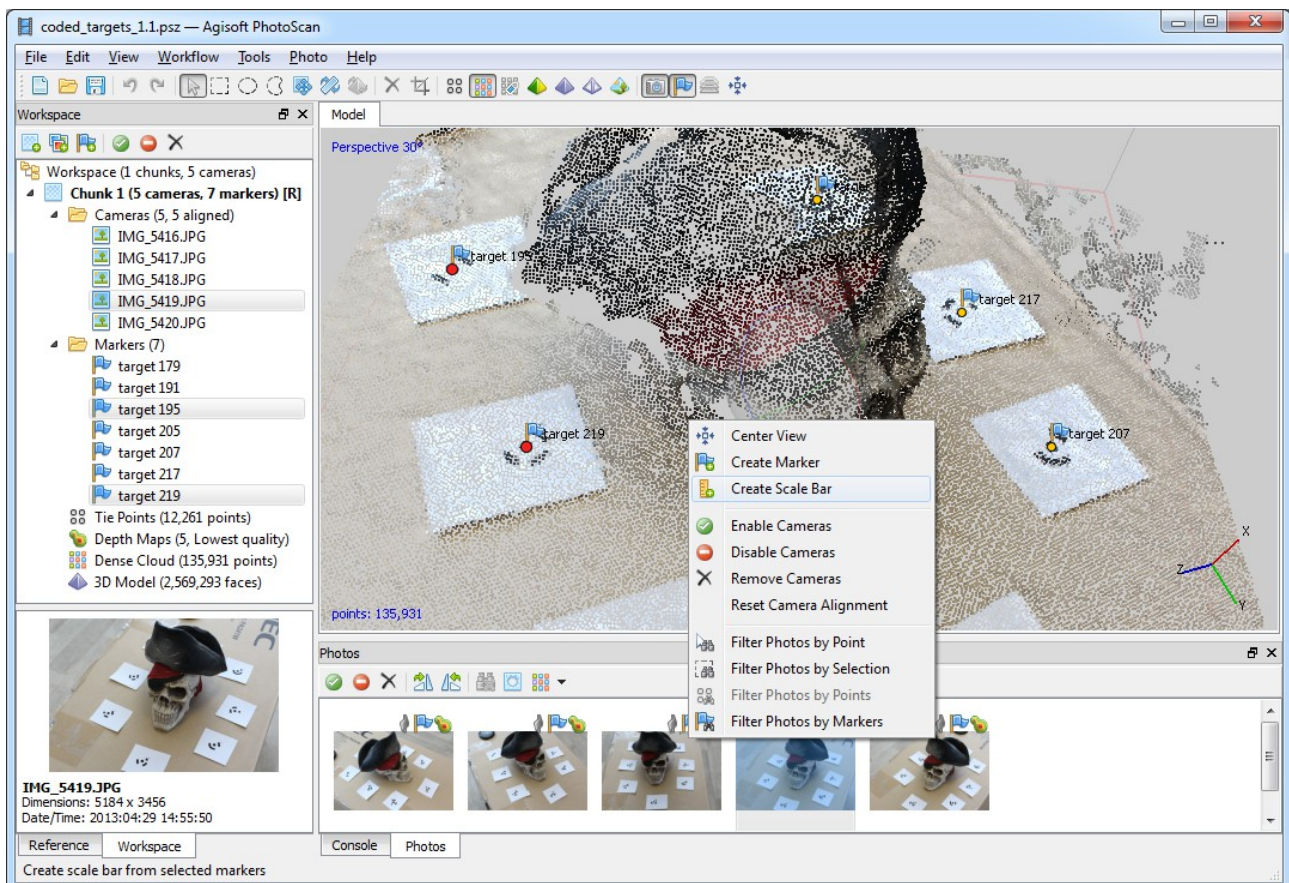
Go to the *Reference* pane and inset the distance for every scale bar the distance is known for:

Check all the scale bars you want to use for model scaling and press 🔄 *Update* button. The scale will be applied to the model.

To apply correct model orientation in space use 🔷 *Rotate Object* tool.