

Useful Tips on Image Capture: How to Get an Image Dataset that Meets Metashape Requirements?

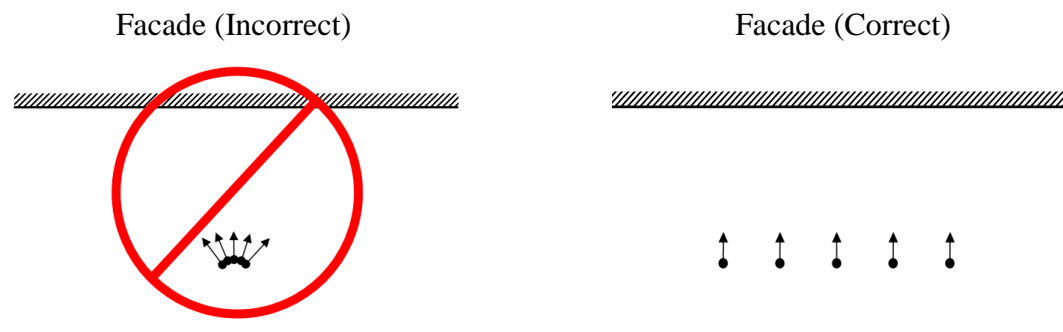
I. Equipment

1. Agisoft Metashape allows to process images shot with both metric and non-metric cameras. It means that, in fact, today you can carry out a true photogrammetric research with the help of an ordinary *digital consumer-level camera*. No special photogrammetry equipment required!
2. Agisoft Metashape does not set any requirements concerning the image resolution neither. However, it is reasonable to remember that the resolution of the input data influences the quality of the processing results. That is why it is strongly recommended to employ a camera with *5Mpx resolution* at least. While to produce professional quality orthophotomaps, it is better to opt for *12Mpx resolution* photography.
3. Agisoft Metashape estimates camera calibration parameters automatically; consequently, generally there is *no need to run precalibration procedure* manually.

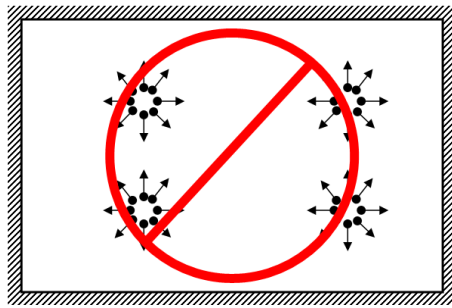
However, since the software applies Brown model to simulate lens assembly, automatic calibration works perfectly well for “standard” optics (that is with 50 mm focal length (35 mm film equivalent)). To process data collected with “fish eye” lenses, you need to indicate corresponding camera type in the program settings*. The software is also capable of spherical camera data processing, providing that it implements equirectangular projection. If the source data was captured with ultra-wide angle lenses, the operation is likely to fail. In this case, one should enter calibration data to the program to achieve good reconstruction results.

II. Shooting Process Planning

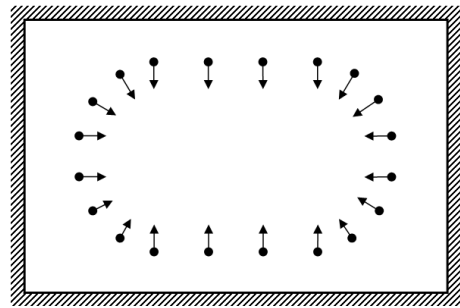
1. Figures below illustrate the basic ideas about proper shooting scenarios.



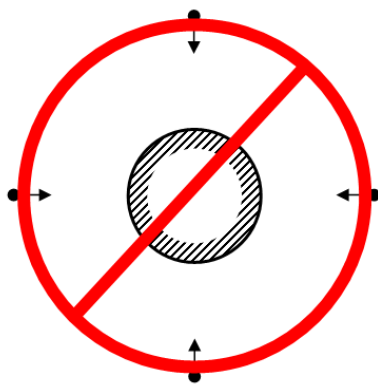
Interior (Incorrect)



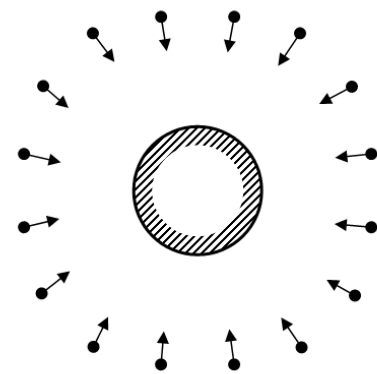
Interior (Correct)



Isolated Object (Incorrect)



Isolated Object (Correct)



2. For the successful completion of the reconstruction task it is crucial to guarantee enough image overlap across the input dataset. In case of aerial photography the requirement can be put in the following figures: **60% of side overlap + 80% of forward overlap** at least.
3. Care about **object texture** and invent tricks to **avoid plain/monotonous and glittering surfaces**. For example, in case you are to shoot a human leg, put a finely textured sock on it before; if you target object is a car, spread some talc over it to change from glittering to dull surface.
4. If you are to build a texture map of the object, that you had to “specially prepare” before shooting like in the examples above, you need, in fact, to capture two sets of images of the same object: one of the “natural” texture of the object and the other of the talc/etc. covered. Key point here is that you need to take both sets of images from the same camera positions, which, actually, forces you to organize **fixed set of cameras** for such shooting scenario to prove successful.

5. If you are planning to carry out any measurements based on the reconstructed model, do not forget to locate at least two *markers* with a known distance between them on the object. Alternatively, you could place a ruler within the shooting area.

In case of aerial photography and demand to fulfill georeferencing task, even spread of *ground control points (GCPs)* (at least 10 across the area to be reconstructed) is required to achieve results of highest quality, both in terms of the geometrical precision and georeferencing accuracy. Yet, Agisoft Metashape is able to complete the reconstruction and georeferencing tasks without GCPs, too.

For more detailed guidelines and cautions on camera choice and shooting scenarios please see Chapter 2 in Agisoft Metashape User Manual available here <http://www.agisoft.com/downloads/user-manuals/> .

* Feature is available starting from the version 1.1.0 of Agisoft PhotoScan