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Good Photos vs. Bad Photos for Close-range Photogrammetry

When it comes to close-range photogrammetry, the difference between "good" photos and "bad" photos can be the difference between getting useful 3D information and having complete failure. There are many different variables contributing to success or failure of a project, but to help avoid the most common mistakes a photographer can follow the general guidelines outlined below.

Basic photographic concepts that, when followed, generally produce acceptable digital images:

    Camera/lens Properties:
-Use a mid to high resolution camera (at least 12-15MP)
-Use a fixed (non-zoom) lens
-Tape the focus ring (and set to manual focus)
-If using a zoom lens, tape the zoom ring and use one focal length for the entire project

    Camera Placement:
-Use a tripod and stable tripod head
-Frame the subject tightly, making use of the entire sensor area
-Maintain 60-80% overlap between photos
-Ensure all important areas of the object are visible in at least three images
-Be aware of camera geometry required by software (baseline, convergent angles)

    Camera Settings:
-Use aperture priority mode (set to between f/8 and f/16)
-Use a timer or wired/wireless shutter release to minimizes motion blur
-Use mirror lock-up, if available, to further minimizes motion blur

"Good" close-range photogrammetry example from Ostia Antica, Italy. Note that the object (the temple) is framed tightly, and that all objects (both near and far) are in sharp focus.

A list of common mistakes made while capturing digital images for a close-range photogrammetry project:

    Camera/lens:

-Use of low resolution camera (8MP or less)
-Changing zoom (focal length) between images
-Use of loose/damaged lens
-Significant re-focusing due to varying distance from object

    Camera placement:
-Handheld camera (no tripod)
-Insufficient overlap between images
-Inefficient use of sensor area (too far from subject)
-weak camera geometry (multiple images from one position, short baseline, overall poor network of image locations/orientations)

    Camera settings:
-shallow depth of field (below f/8)
-manual shutter release (causes motion blur)

"Bad" close-range photogrammetry example. Note that

the object (the temple) is not framed tightly, and that most objects are blurry and out of focus.

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