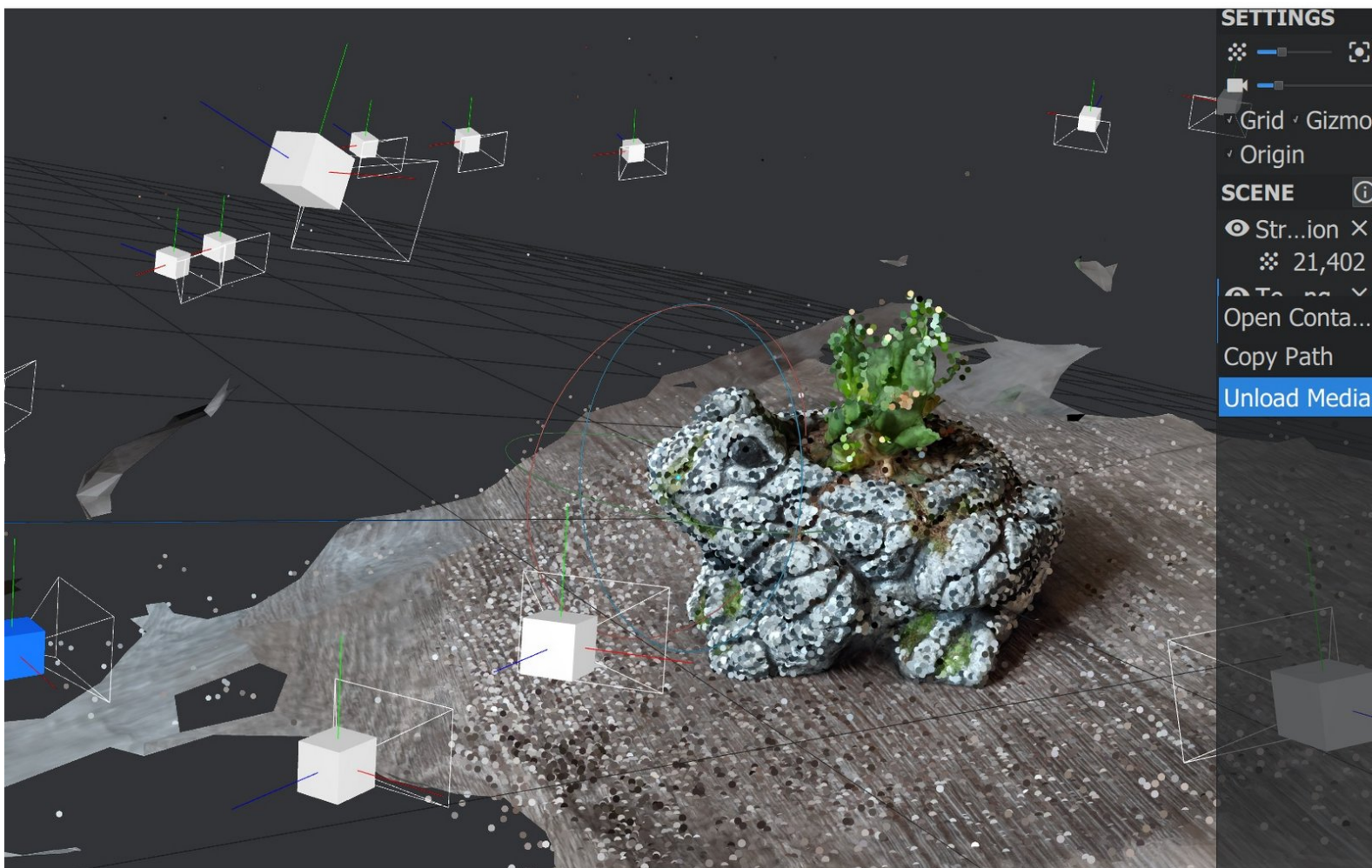




# Photogrammetry

Photogrammetry consists of processing a large number of photographs of an object from a variety of angles into a 3D mesh.

**Written By: Eli Jared Fastow**



## Introduction

Photogrammetry consists of processing a large number of photographs of an object from a variety of angles into a 3D mesh. This guide provides a basic introduction to the use of Meshroom, a free and robust photogrammetry software.

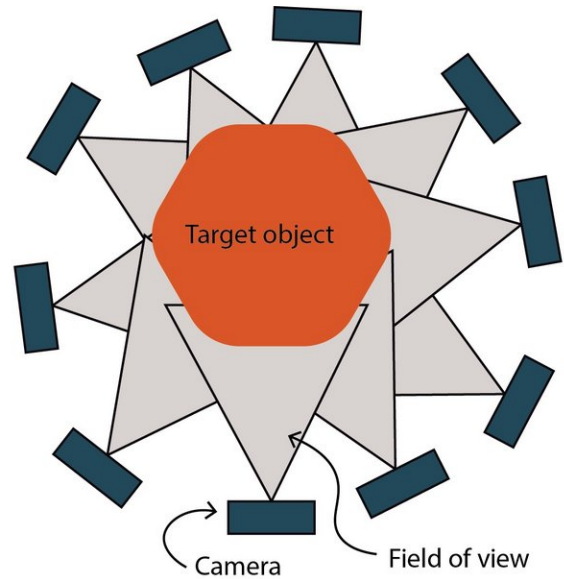
## Step 1 — Appropriate Use of Photogrammetry

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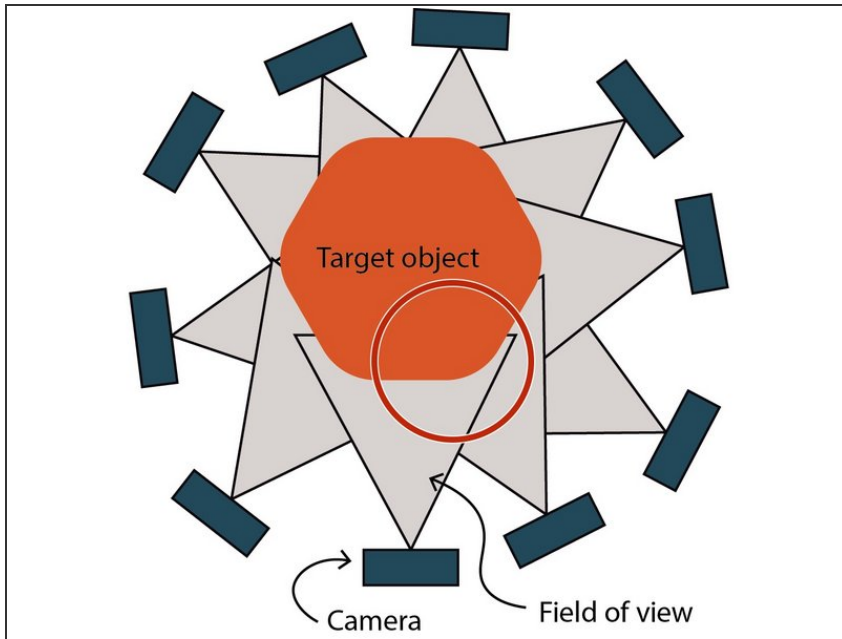
- Photogrammetry is far less accurate and precise than any of the other scanners available at Terrapin Works
- If another scanner is available and the object fits within its appropriate use-case, use a designated 3D scanner.
- Objects not reasonable to scan with designated 3D scanners, like buildings, trees, or other large objects may fit within the use case for photogrammetry
- Photogrammetry also works for objects with textures not amenable to the other 3D scanning technologies, like plants.

## Step 2 — Setting up the object and surroundings



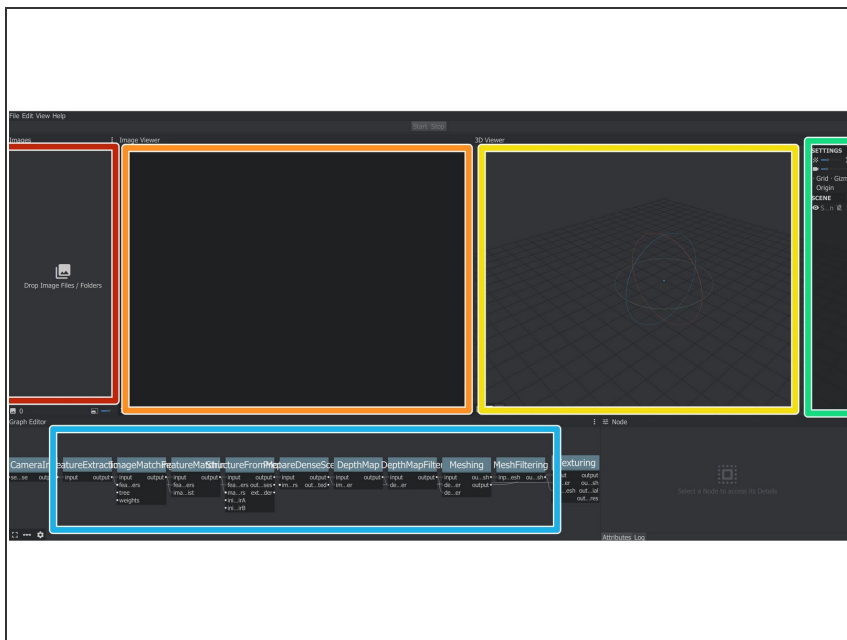
- Successfully constructing a 3D mesh of an object from photogrammetry requires capturing dozens of pictures from all relevant angles.
- The term all relevant angles typically means a 360 view of the object, but for a target where all the important features are on one side - like a human face - only focus on that area.
- The field of view for adjacent photographs should overlap by at least 50%
- Make sure you have access to take a picture of the object from all relevant angles
- Try to keep the lighting on the object as uniform as possible
- Keep the background as featureless as possible
- Try to reduce deep shadows on the object

## Step 3 — Taking Pictures



- Take photographs across the range of relevant angles on multiple planes
- Make sure each photo overlaps by about 50%
- Take pictures on a maximum depth of field
- Attempt to reduce photographic aberrations, including motion blur, lens flares, over/under exposure, and poor focusing
- Save all photos as high resolution images. Compressed photos can create artifact features that Meshroom may mistake for real objects.

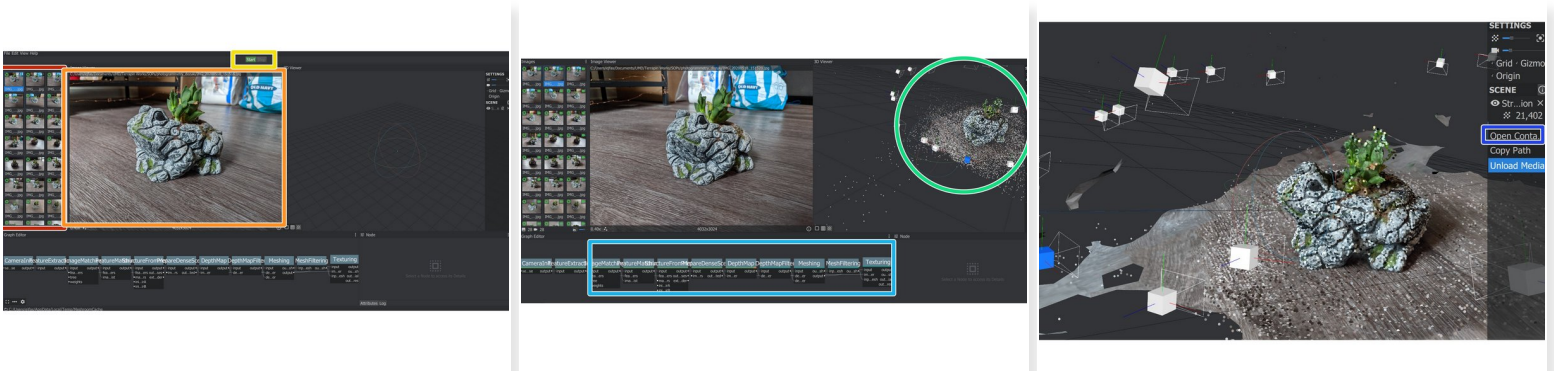
## Step 4 — Meshroom layout



- Catalog of all images taken
- Display of selected image
- Display of generated mesh
- Mesh settings
- Processes used to convert images to mesh



## Step 5 — Processing Images in Meshroom



- Save all of the pictures in a single folder, then drag-and-drop the folder into meshroom
- Click on any individual image in the image catalog to view it at full resolution
- Check all images are clear, focused, and centered
- Click the start button to run the algorithm that converts images to mesh files. Note that this process may take a while and use lots of CPU resources.
- As the algorithm runs, it will begin to build a mesh. Once the algorithm finishes running, press the load model button
- Track progress with the processes window at the bottom. The orange bar indicates the step currently operating
- After clicking the load model button, a mesh file is automatically exported. Click the open containing folder button to see it.