THODE MAKERSPACE
PHOTOGRAMMETRY

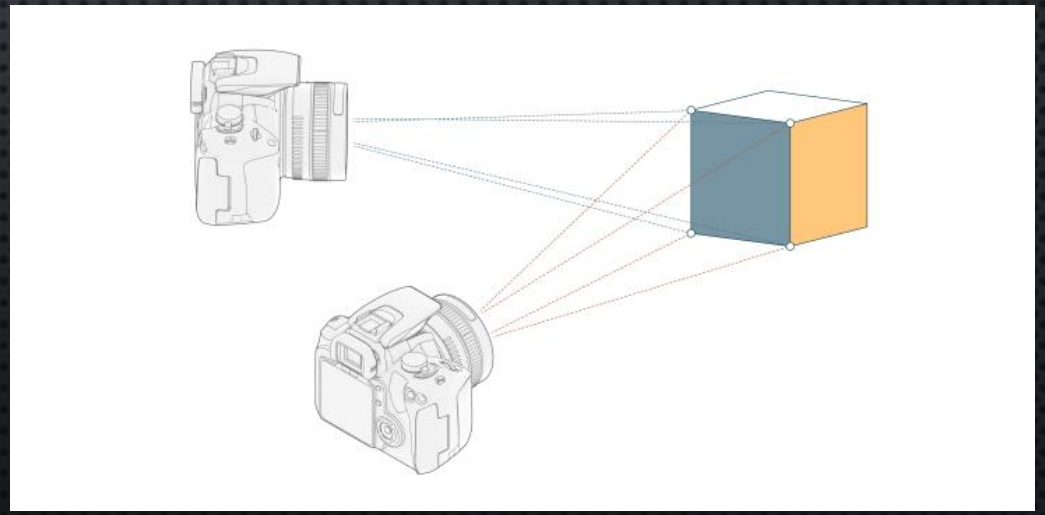
PHOTOGRAMMETRY
WHAT IS IT?

"PHOTO" – LIGHT

"GRAMMA" – WRITING/DRAWING

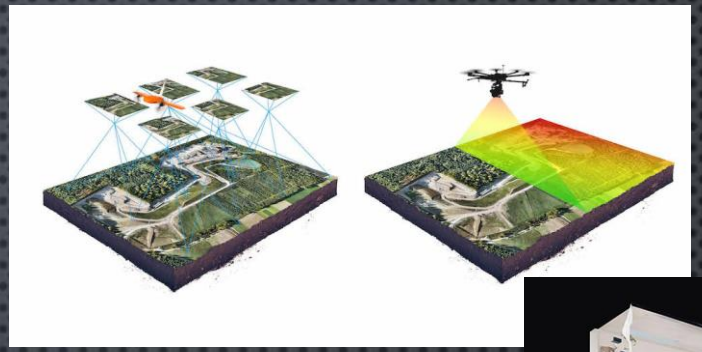
"-METRY – MEASUREMENTS

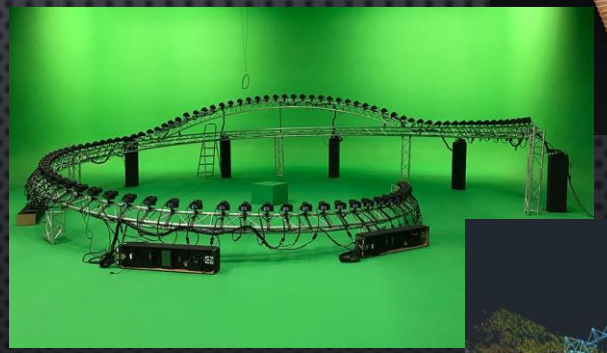
THE PROCESS OF COLLECTING INFORMATION & MEASUREMENTS OF A PHYSICAL OBJECT/SCENE BY TAKING PHOTOS. THESE MEASUREMENTS CAN THEN BE PROCESSED THROUGH PHOTOGRAMMETRY SOFTWARE TO CREATE DRAWINGS & 3D MODELS.



THIS PROCESS INVOLVES CAPTURING MANY IMAGES. EACH CONSECUTIVE IMAGE SHOULD OVERLAP IN CONTENT SO THE SOFTWARE CAN RECOGNIZE ANY CHANGES & STITCH THE PHOTOS TO CREATE A COHESIVE MODEL.

PHOTOGRAMMETRY
USES & APPLICATIONS





Land Surveying

- construction projects, data analysis

Real Estate

- 360 room tours (google maps)

Film & Entertainment

- CGI, virtual reality (matrix bullet scene)

Forensics

- Small details & precise measurements (car crashes)

TODAY'S APPLICATION

- Generating a model of an object, then 3D printing it

PHOTOGRAMMETRY
POLYCAM

App on IOS & Android, no registration required, free trial

Capture objects and spaces through your device's **camera** to create high quality 3D models.

Export file type: .GLTF

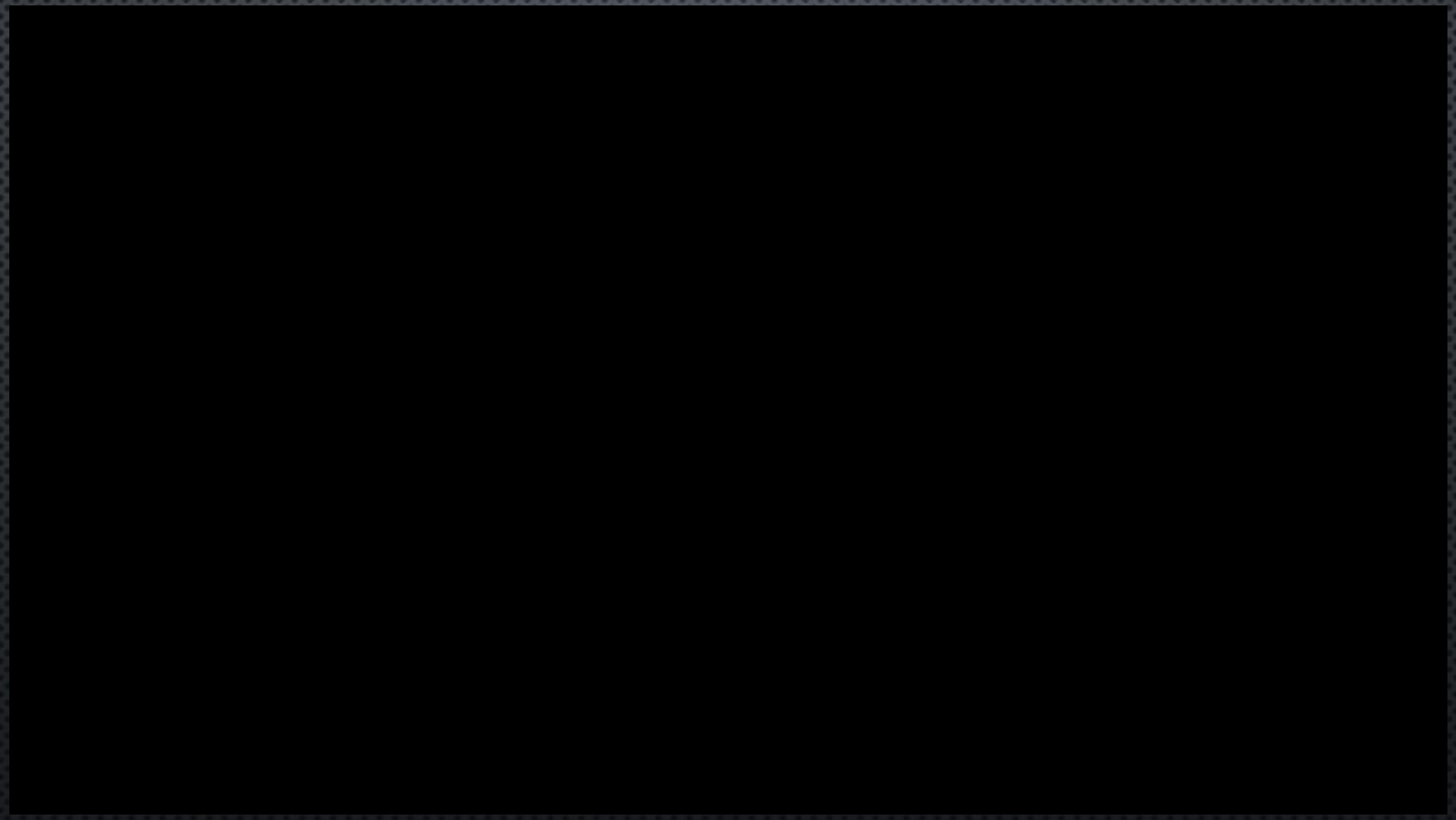
PHOTOGRAMMETRY
MESHLAB

A 3D MESH PROCESSING SOFTWARE

- CAN BE USED TO EDIT THE .GLTF FILE EXPORTED FROM POLYCAM
- ADD A BASE IF MISSING IN THE MODEL
- REMOVE UNWANTED PARTS CAPTURED

MAIN FOCUS: CONVERTING .GLTF TO .STL

0:00 – 3:24
https://www.youtube.com/watch?v=YcNTv4OrDYg&ab_channel=NunoSilva



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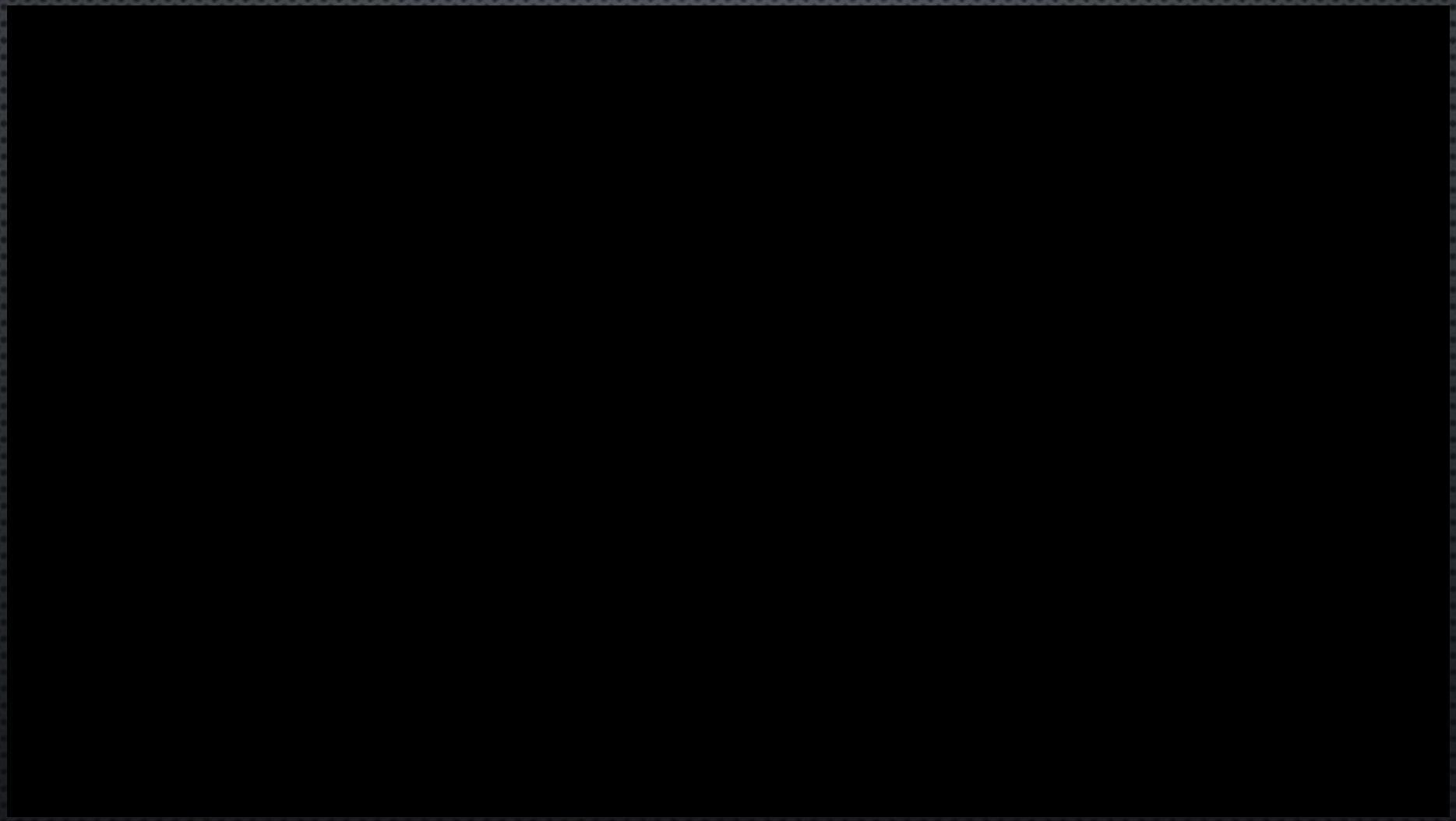
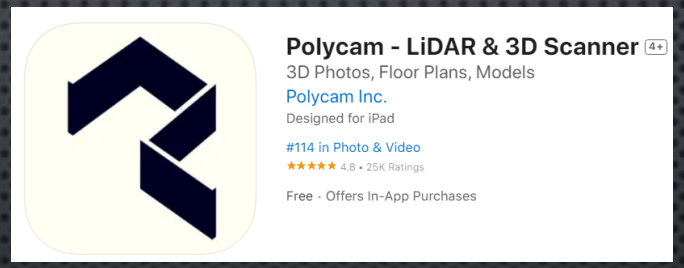


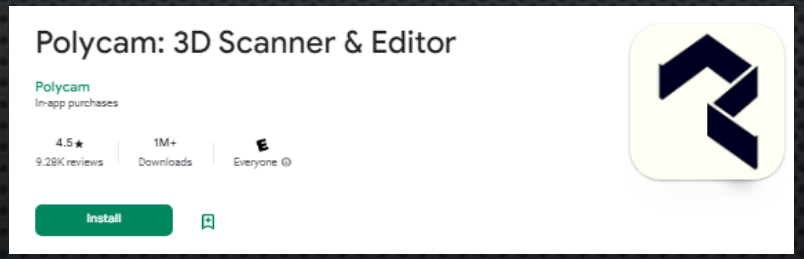
https://www.youtube.com/watch?v=IXMCAvocxXc&ab_channel=Polycam

PHOTOGRAMMETRY
POLYCAM

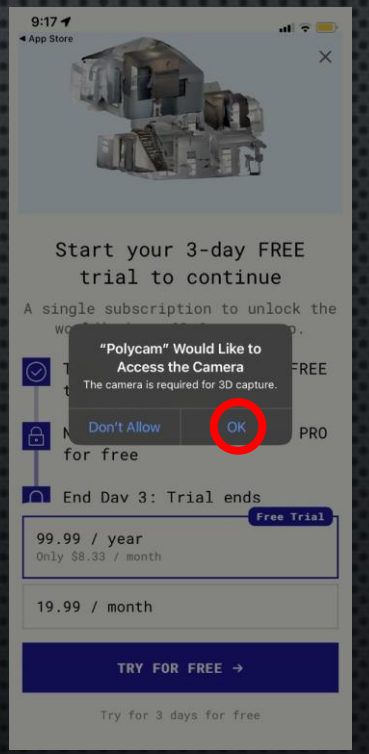
1. PLACE OBJECT ON THE TURN TABLE
   - GOOD LIGHTING, PLAIN BACKGROUND

2. INSTALL AND OPEN POLYCAM





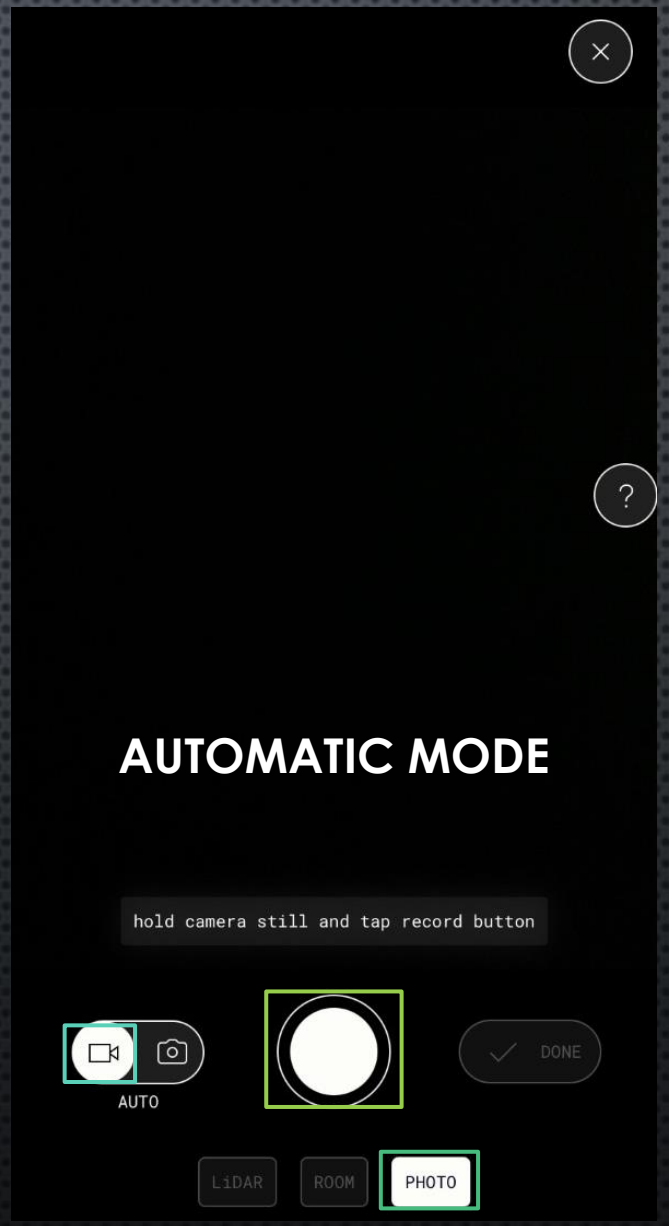
3. OPEN APP, AND ALLOW ACCESS TO THE CAMERA

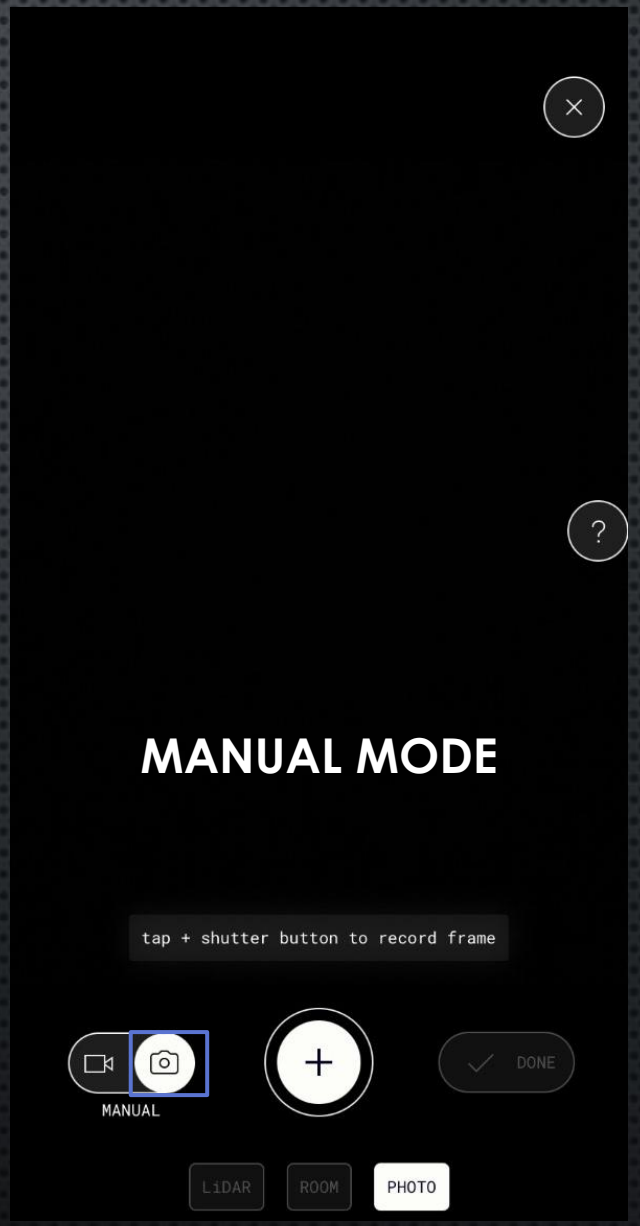


PHOTOGRAMMETRY
POLYCAM

1. **AUTOMATIC:** SET CAPTURE MODE (BOTTOM LEFT) ON VIDEO ICON, AND "PHOTO" IS SELECTED (BOTTOM RIGHT)

2. PRESS RECORD BUTTON, PROGRAM WILL CAPTURE IMAGES AUTOMATICALLY
   - IF CAPTURE MODE (BOTTOM LEFT) SET TO PHOTO ICON, CAMERA MUST BE CLICKED AND BE TAKEN **MANUALLY**





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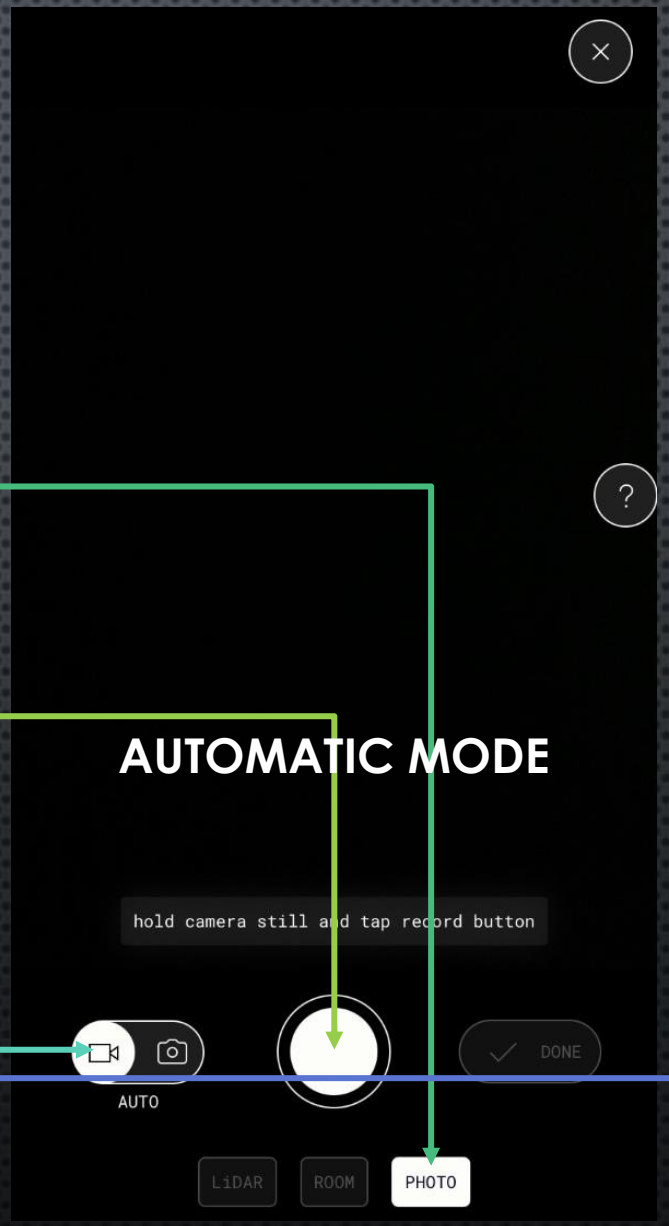
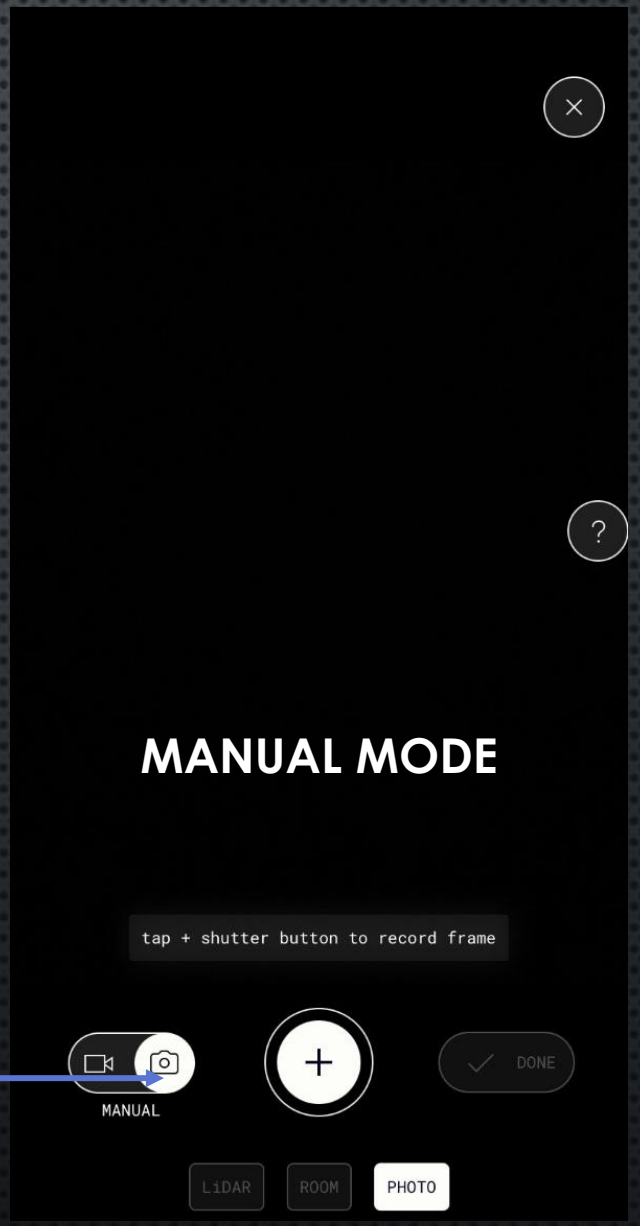
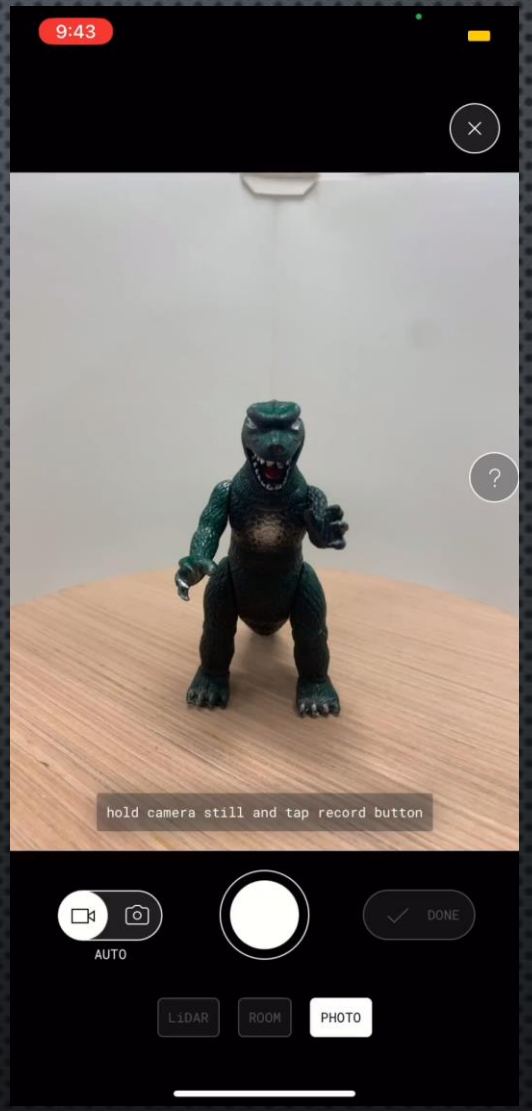
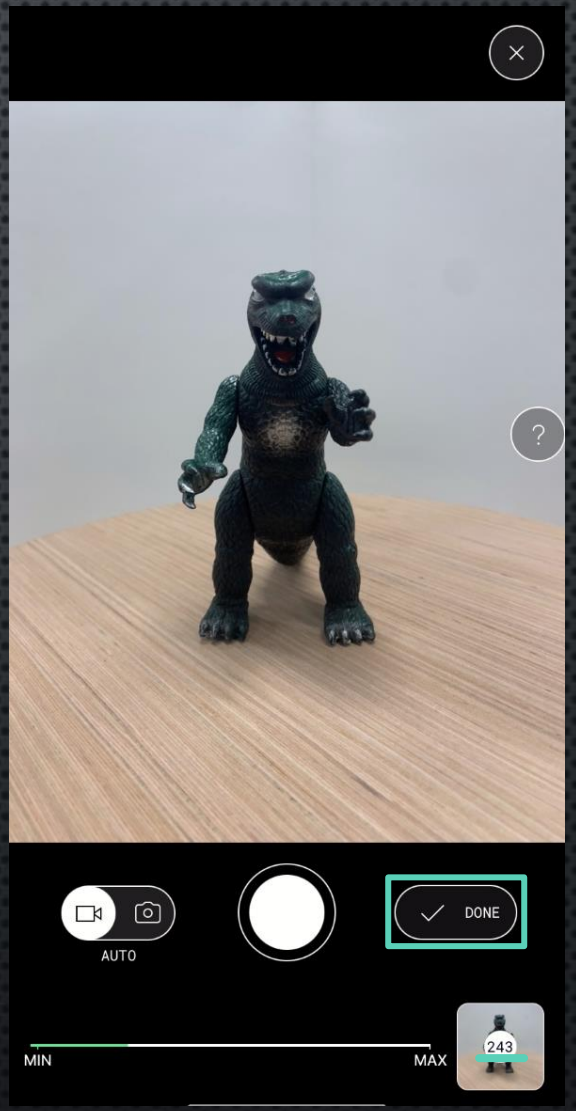




PHOTOGRAMMETRY
POLYCAM

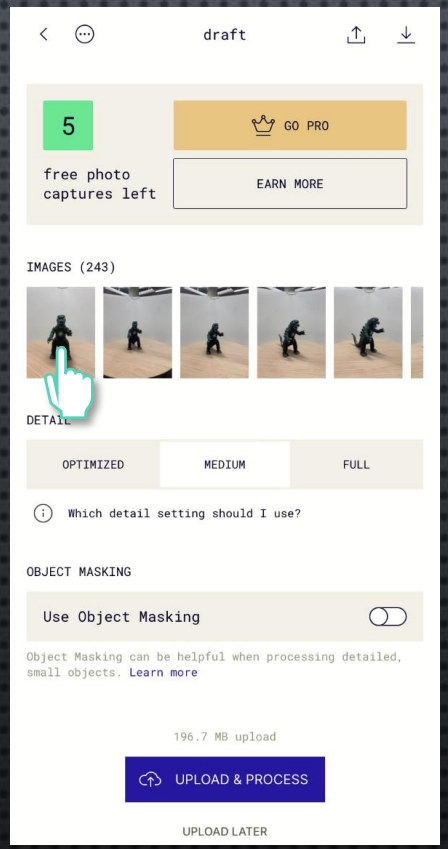
1. Get different angles of the object at varying heights, make sure at least 50% of the object is overlapped between photos. Go slow!
    - For details: get close to the object, the whole object does NOT need to be in the picture at once
2. Spin the turn table while keeping camera in focus on object
3. Flip object on its side to get ALL SURFACES
4. Repeat angles at varying heights
5. Click done once more than 100 photos taken

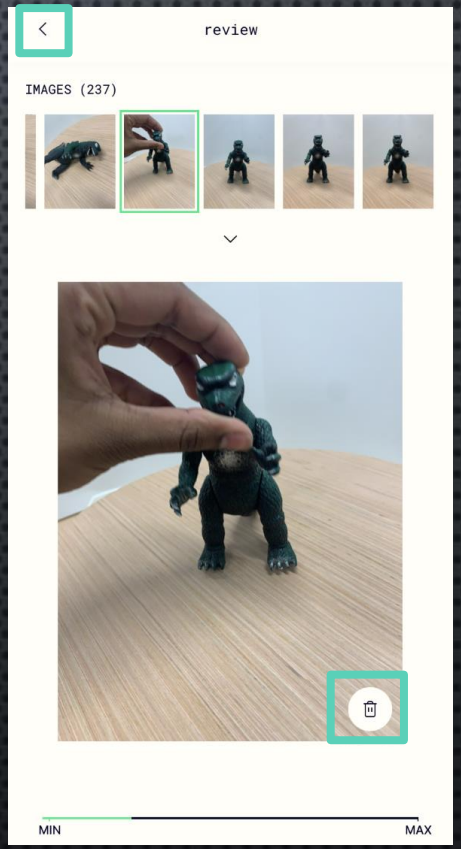


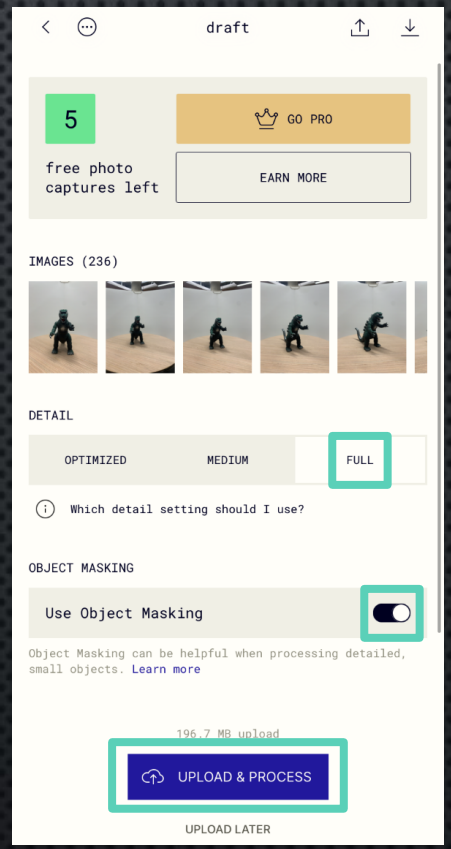


PHOTOGRAMMETRY
POLYCAM

1. Click on the photo gallery and remove blurry, unfocused photos
2. Set Detail: FULL
3. Set Object masking: ON
   - Helps the program differentiate between the object and background
4. Click "upload & Process"

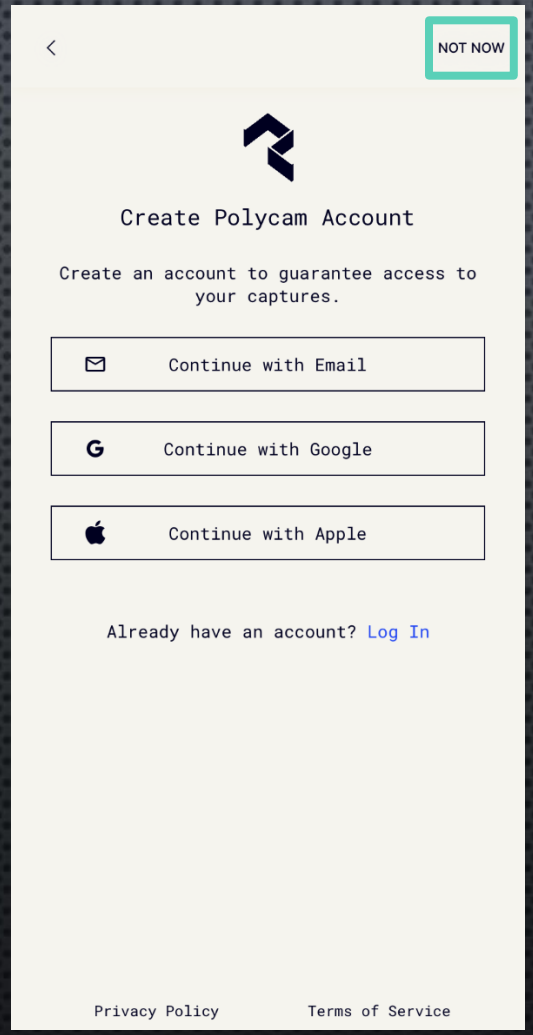


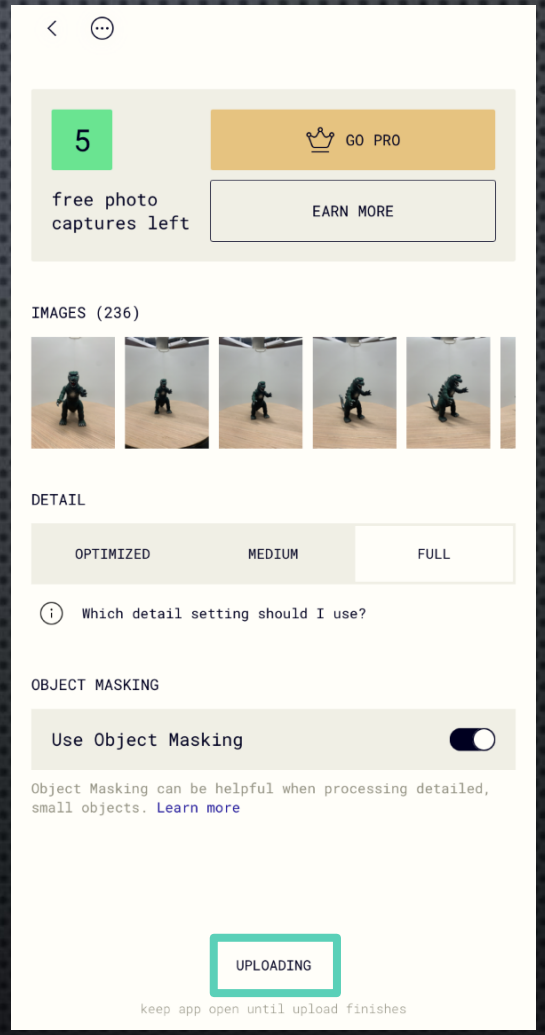


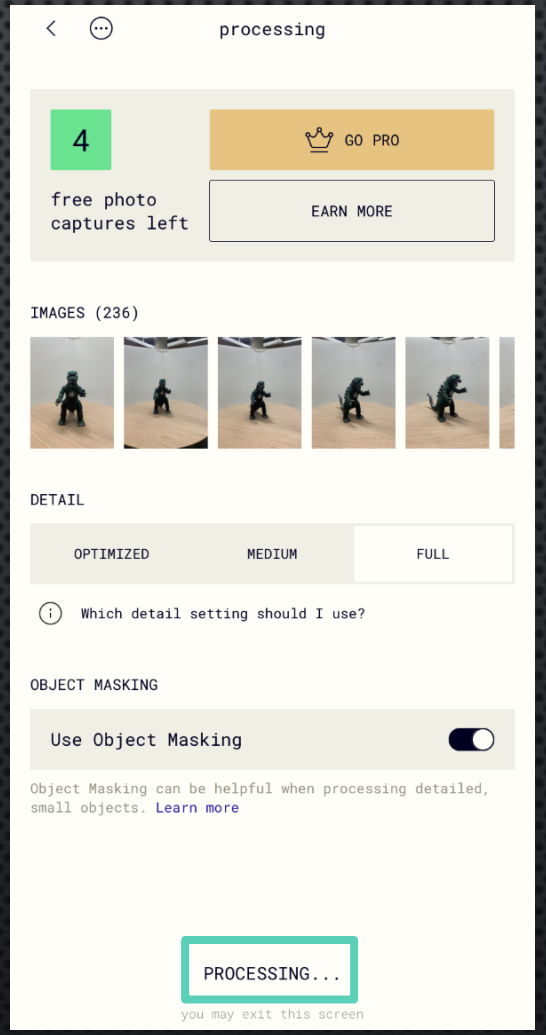


PHOTOGRAMMETRY
POLYCAM

1. SKIP ACCOUNT CREATION*
2. WAIT UNTIL UPLOADING AND PROCESSING IS FINISHED, AND MODEL APPEARS

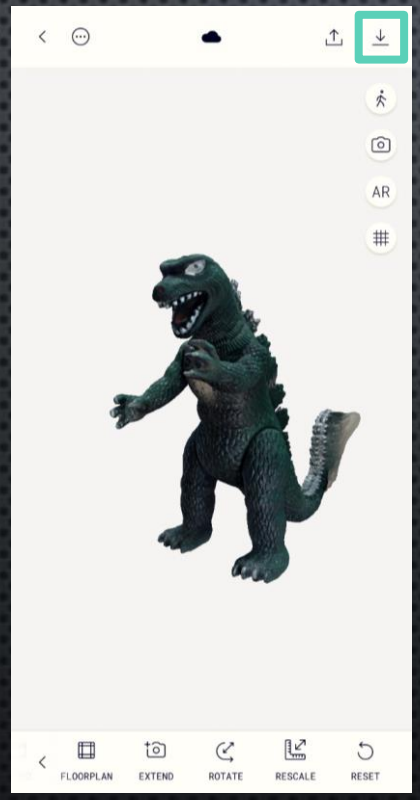


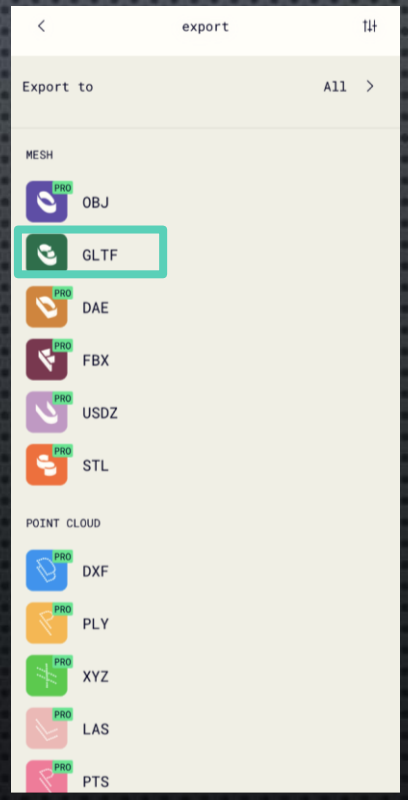


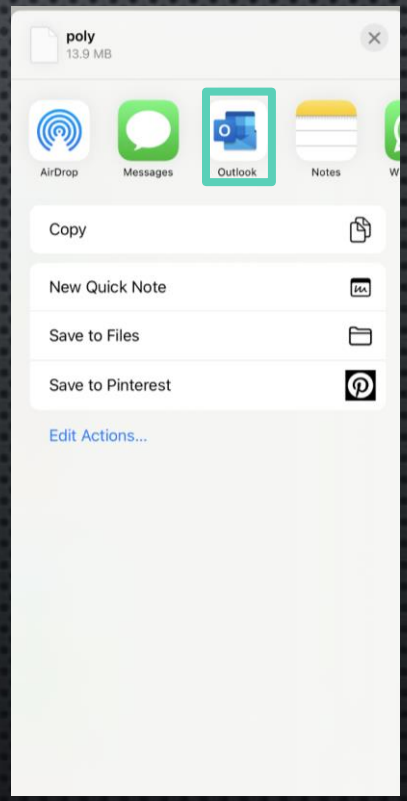


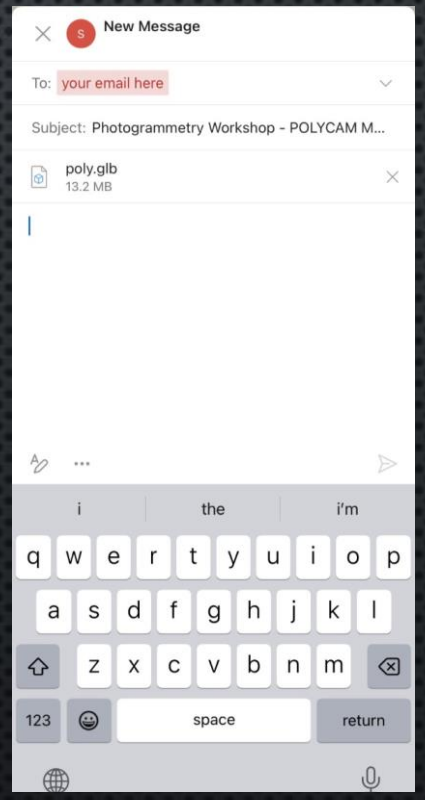
PHOTOGRAMMETRY
POLYCAM

1. Check if model came out well
   - Details captured, not disfigured, looks right
2. Click DOWNLOAD (top right)
3. Export to "GLTF"
4. Share to yourself through email
5. Close POLYCAM



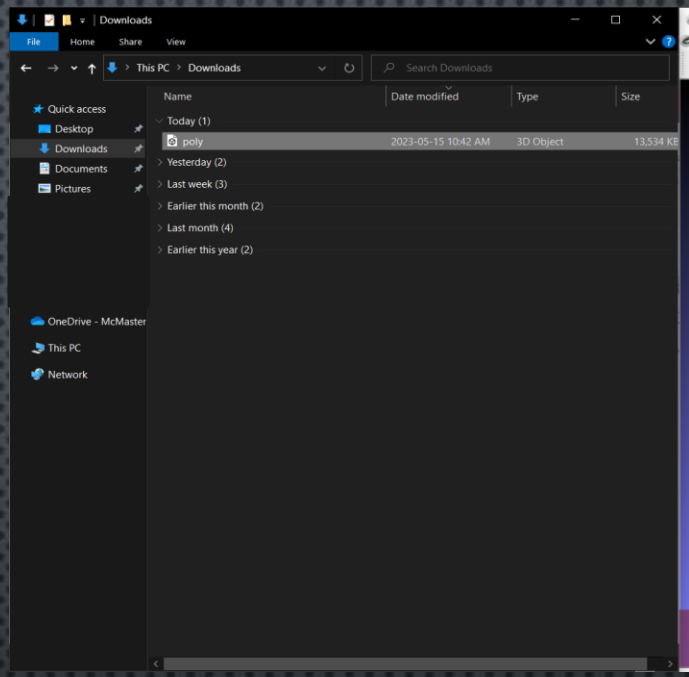


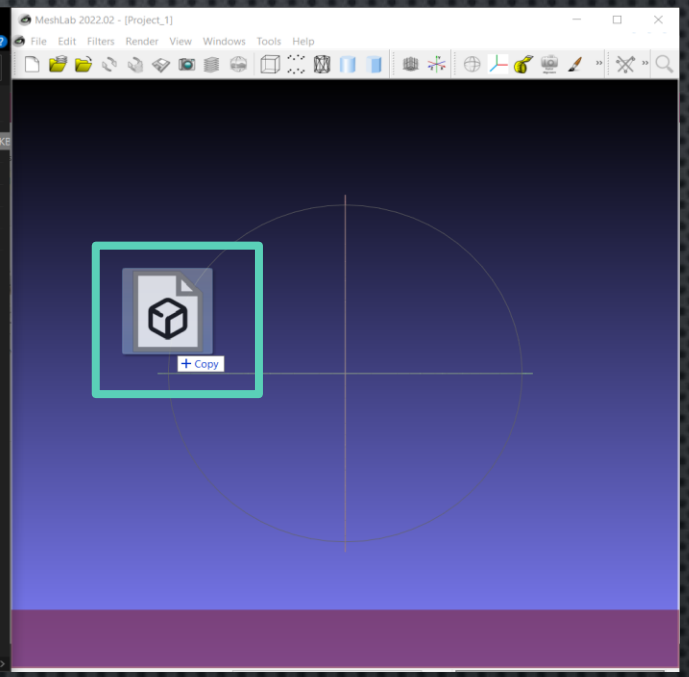


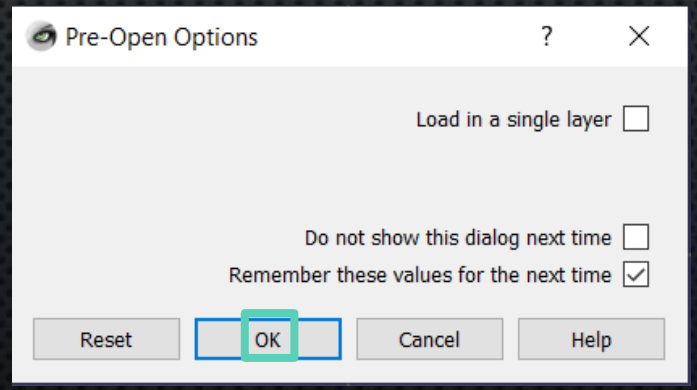


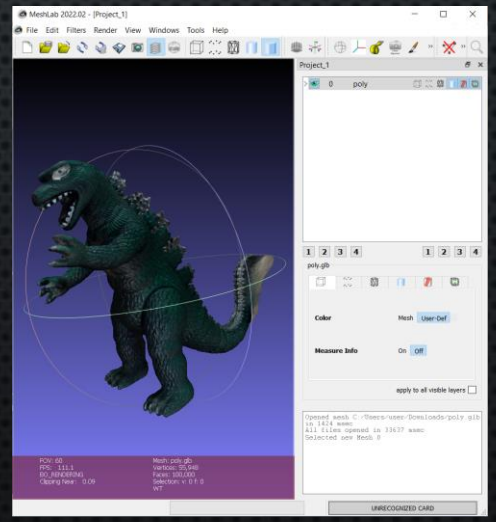
PHOTOGRAMMETRY
MESH LAB

1. Open email and download the file
2. Open “Mesh Lab”
3. Drag file into “Mesh Lab”
   - converting file type from “.gltf” to “.stl” for the 3D Printer Slicer
4. Pre-open options popup: Click “reset”, then “okay”
5. Model will appear



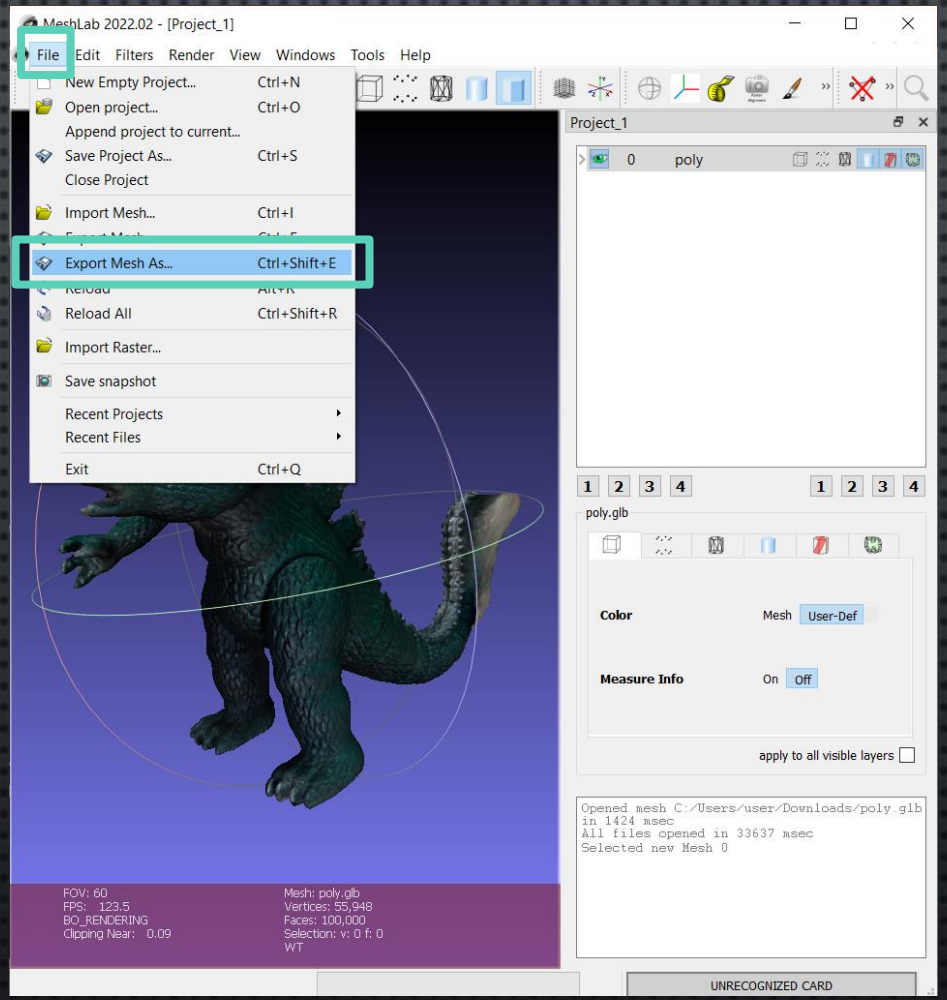


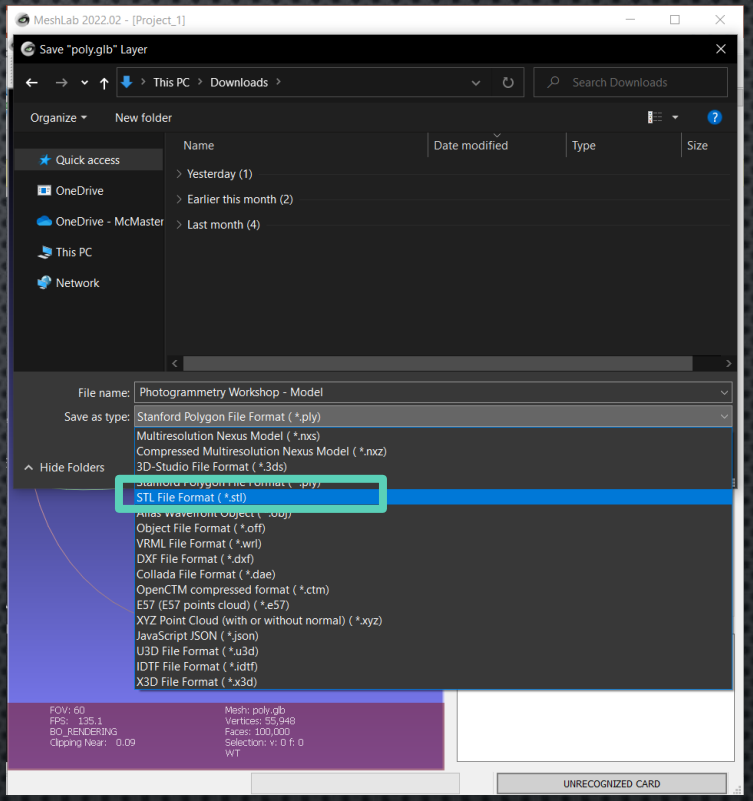


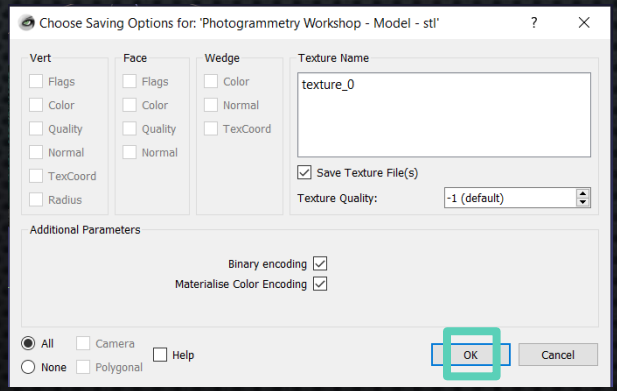


PHOTOGRAMMETRY
MESH LAB

1. Click "FILE" (top right corner)
2. Click "Export Mesh As…"
3. File Name: Up to you
4. Save as type: Click on "STL File Format (*.stl)"
5. Once in the location desired to save, click "Save" (bottom right)
6. Choose saving Options for Popup: Click "Okay"
7. Close mesh lab

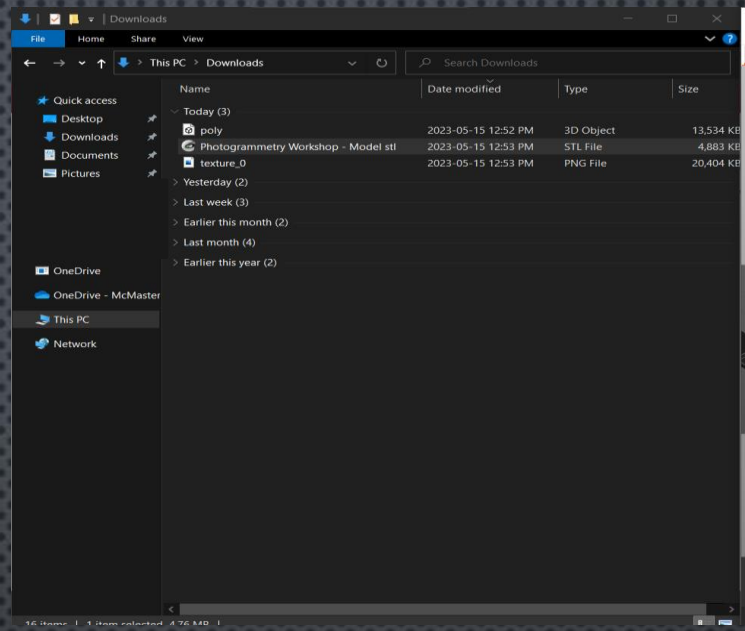


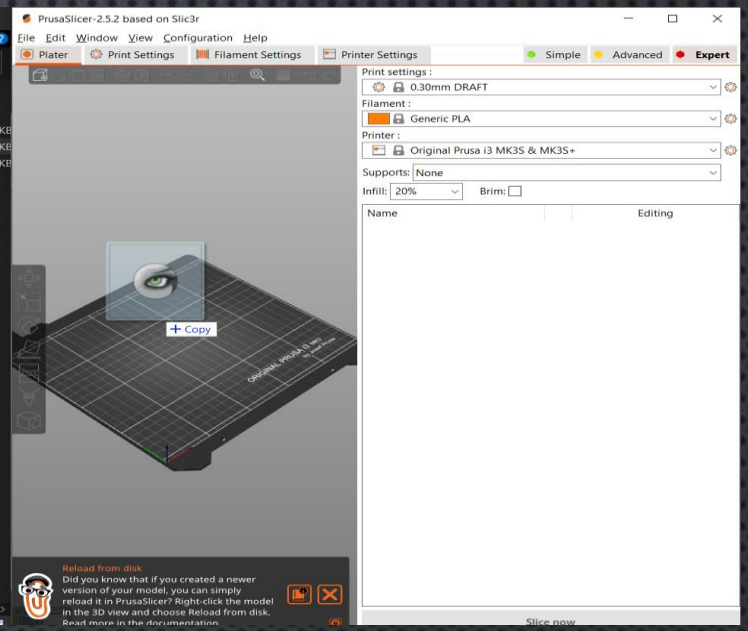


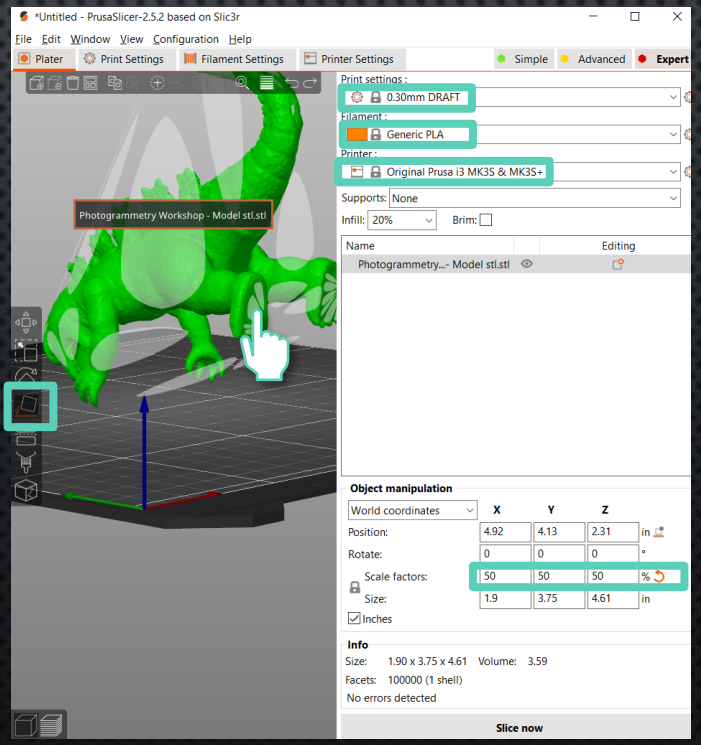


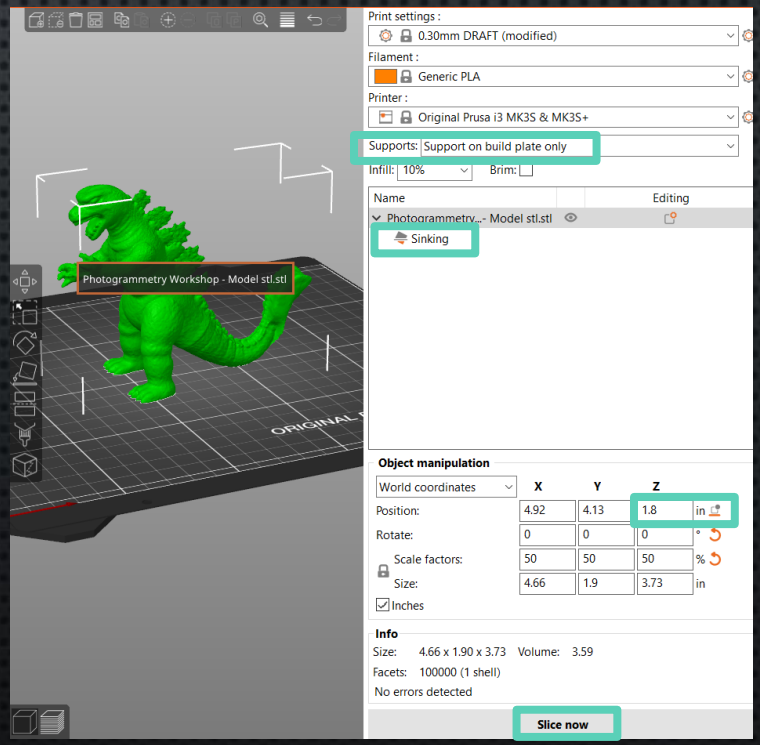
PHOTOGRAMMETRY
PRUSA SLICER

1. Open Prusa Slicer
2. Drag the .STL file into Prusa Slicer
3. Orient/Rotate and Adjust the model to fit for printing
    1. Printing with minimal support?
        - Rotate/Orient the model on its base
    2. Model not fitting in the print area?
        - Lower the Scale Factor
    3. Base of the build is floating?
        - Lower the model position until fully touching (sinking)
4. Check print settings
    1. Print settings: 0.30mm DRAFT
    2. Filament: Generic PLA
    3. Printer: Original Prusa i3 MK3S & MK3S+
5. Add supports if needed
6. Click "Slice Now"



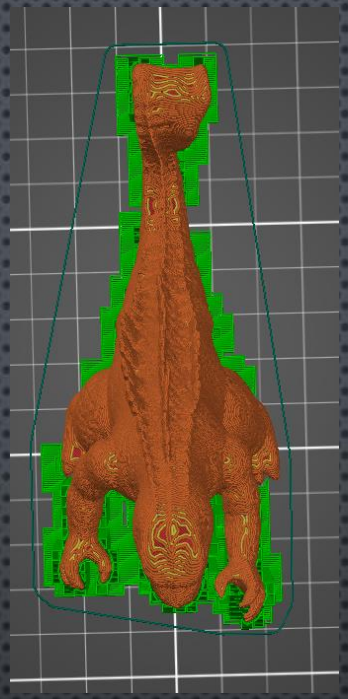


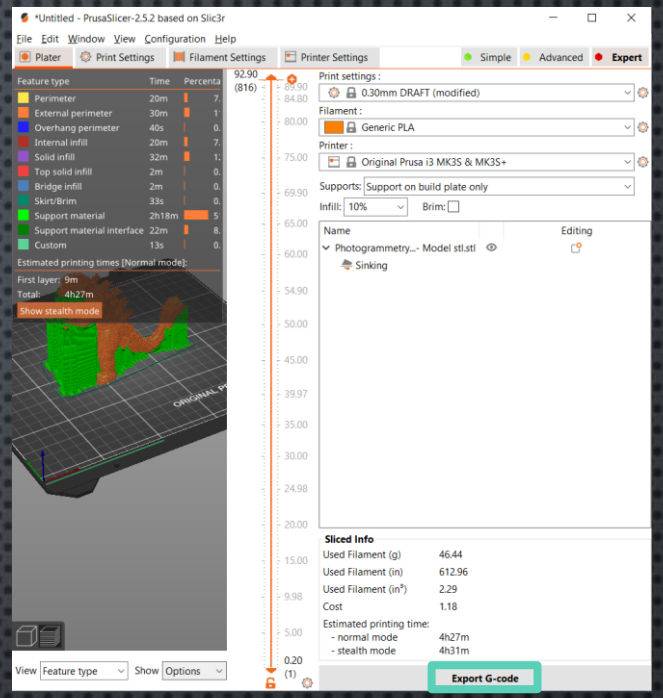


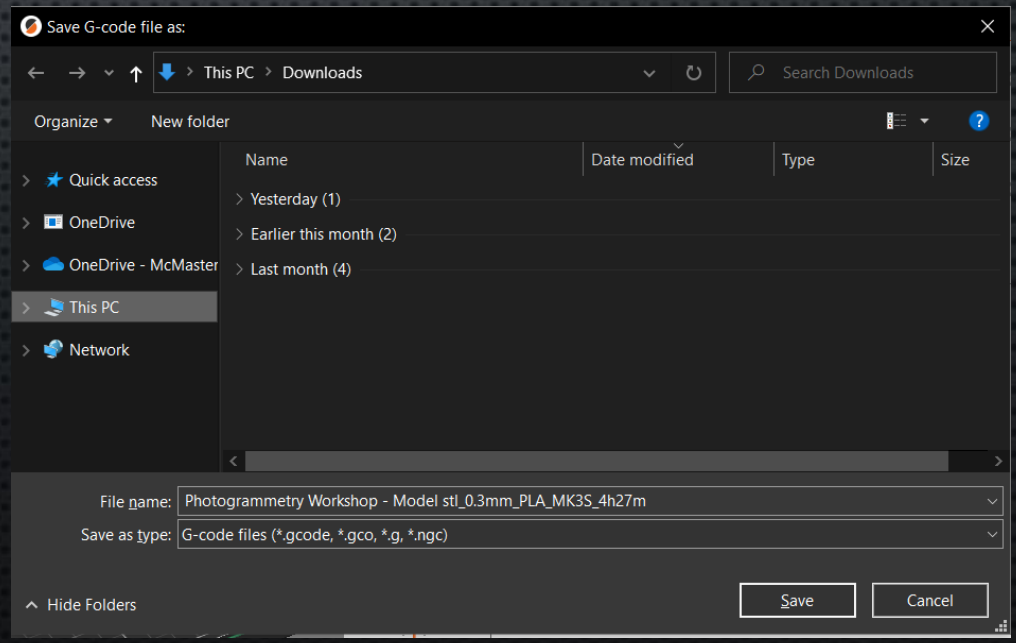


PHOTOGRAMMETRY
PRUSA SLICER

1. Check if skirt (outline around print) is around the entire model
   - If not, means the model is floating and needs to be repositioned to be flat to the bed
2. Click "Export G-code"
3. Save the file onto the provided **SD** cards







THANK YOU

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