

國立中山大學  
National Sun Yat-sen University



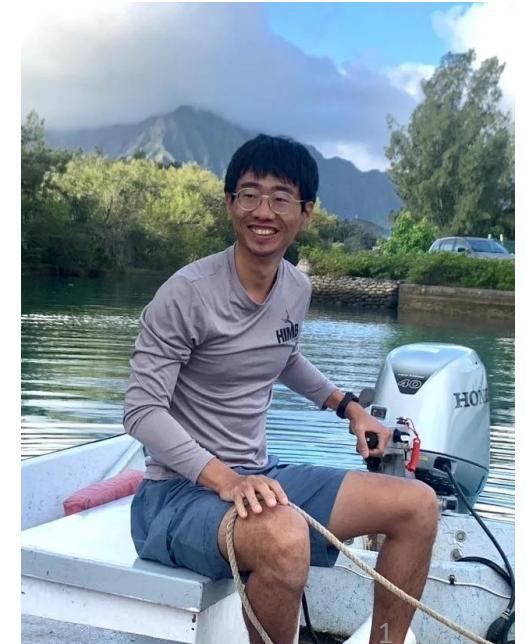
# Metashape NOAA 2024 SOP

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Jun 05 2025  
At National Sun-Yet  
Sen University



# Downloads

[Installer](#)[System Requirements](#)[User Manuals](#)[Geoids](#)[Sample Data](#)

## Agisoft Metashape 2.1.4

This is a previous released version.

Professional Edition

[Windows](#)[macOS](#)[Linux](#)

Standard Edition

[Windows](#)[macOS](#)[Linux](#)

## Python 3 Module

Python module for the previous Metashape version.

[Windows](#)[macOS](#)[Linux](#)

## Agisoft Viewer

A free stand-alone software to visualize 3D data.

Measure distances, areas, volumes; calculate profiles; draw polylines, polygons. [Agisoft Viewer Tutorials](#).

[Windows](#)[macOS](#)[Linux](#)

# Downloads

[Installer](#)[System Requirements](#)[User Manuals](#)[Geoids](#)[Sample Data](#)

## RAM

In most cases the maximum project size that can be processed on a machine is limited by the amount of RAM available. Therefore, it is important to select a platform allowing to install the amount of RAM required for the projects to be processed. See [Memory Requirements](#) article for information on typical RAM consumption at common processing steps.

## CPU

Complex geometry reconstruction algorithms of the photogrammetric software require a significant amount of computational resources for optimal data processing. Hence, a high speed multi core CPU (6+ cores, 3 GHz+) is recommended.

## GPU

Agisoft Metashape supports GPU acceleration for most resource-intensive processing steps, thanks to this it is possible to speed up the processing using high-end OpenCL or CUDA compatible graphics cards with high number of unified shaders (CUDA cores or shader processor units).

### Basic Configuration

up to 32 GB RAM (Laptop or Desktop)

**CPU:** 4 - 12 core Intel, AMD or Apple M1/M2 processor, 2.0+ GHz

**RAM:** 16 - 32 GB

**GPU:** NVIDIA or AMD GPU with 1024+ unified shaders  
(For example: GeForce RTX 2060 or Radeon RX 5600M)

### Advanced Configuration

up to 128 GB RAM (Desktop or Workstation)

**CPU:** 6 - 32 core Intel or AMD processor, 3.0+ GHz  
(For example: Intel i7 / i9 or AMD Ryzen 7 / Ryzen 9 / Threadripper)

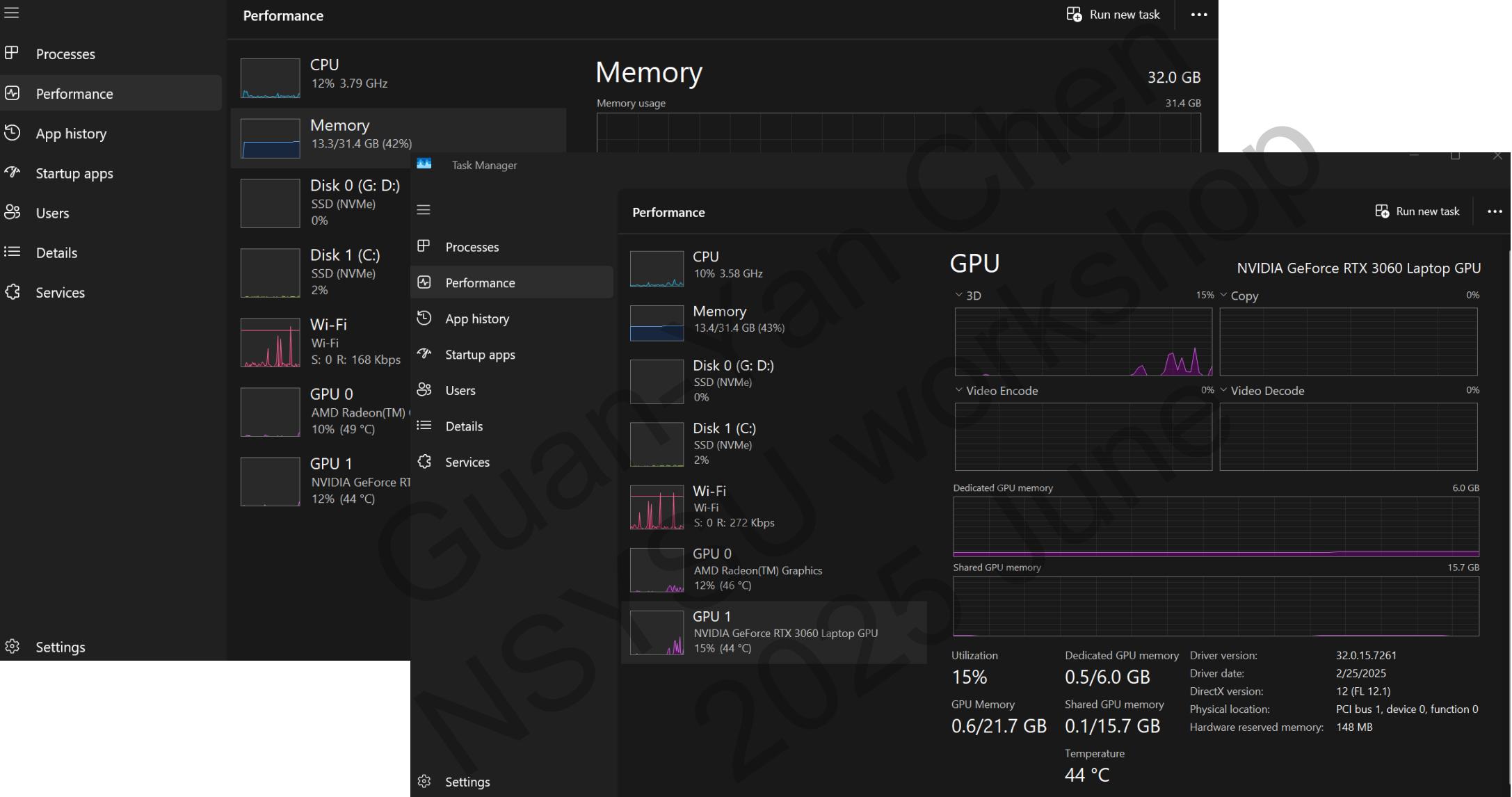
**RAM:** 32 - 128 GB

**GPU:** 1 - 2 NVIDIA or AMD GPUs with 1920+ unified shaders  
(For example: GeForce RTX 3080 or Radeon RX 6800 XT)

### Extreme Configuration

128+ GB RAM (Server)

For processing of extremely large data sets a dual-socket Intel Xeon or AMD EPYC based servers (3.0+ GHz) with Quadro, Tesla, Radeon Pro or Instinct GPUs can be used.



File Edit View Workflow Model Photo Ortho Tools Help



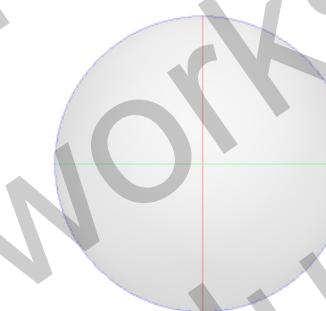
Workspace  
Model Ortho  
Perspective 30°  
Workspace (1 chunks, 0 cameras)  
Chunk 1 (0 cameras)

Snap: Axis, 3D

工作面板

視覺化面板

Traceball



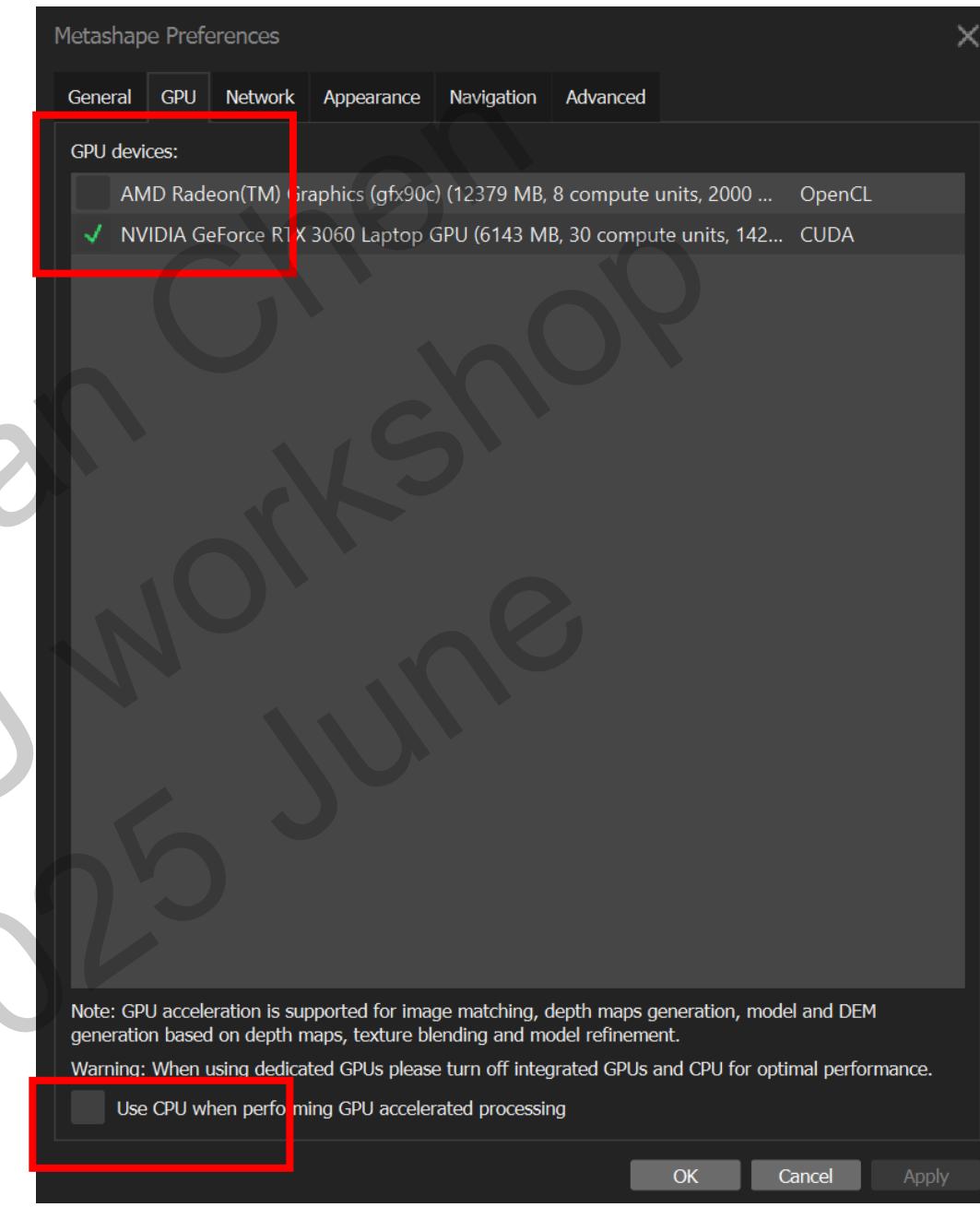
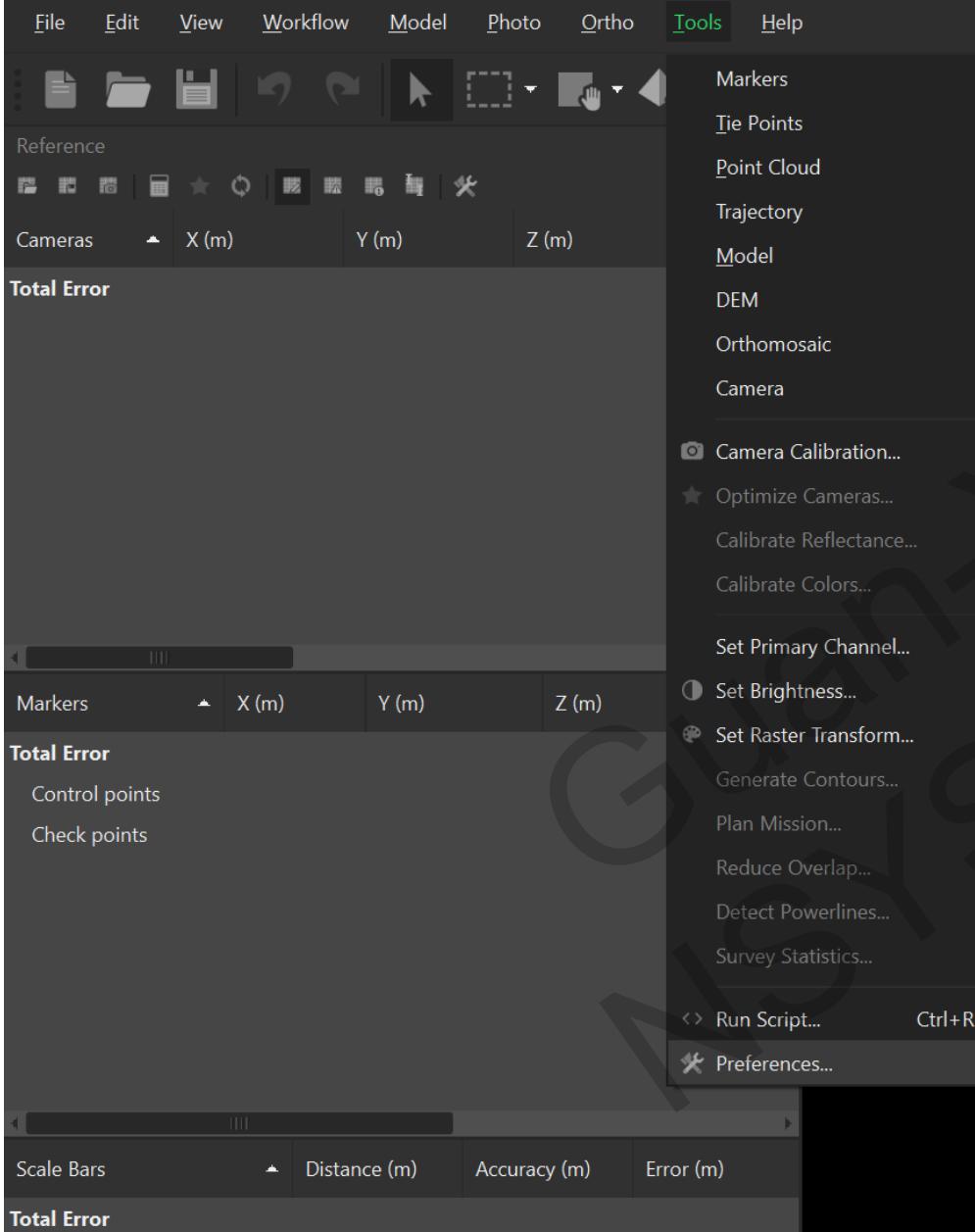
Y  
Z  
X

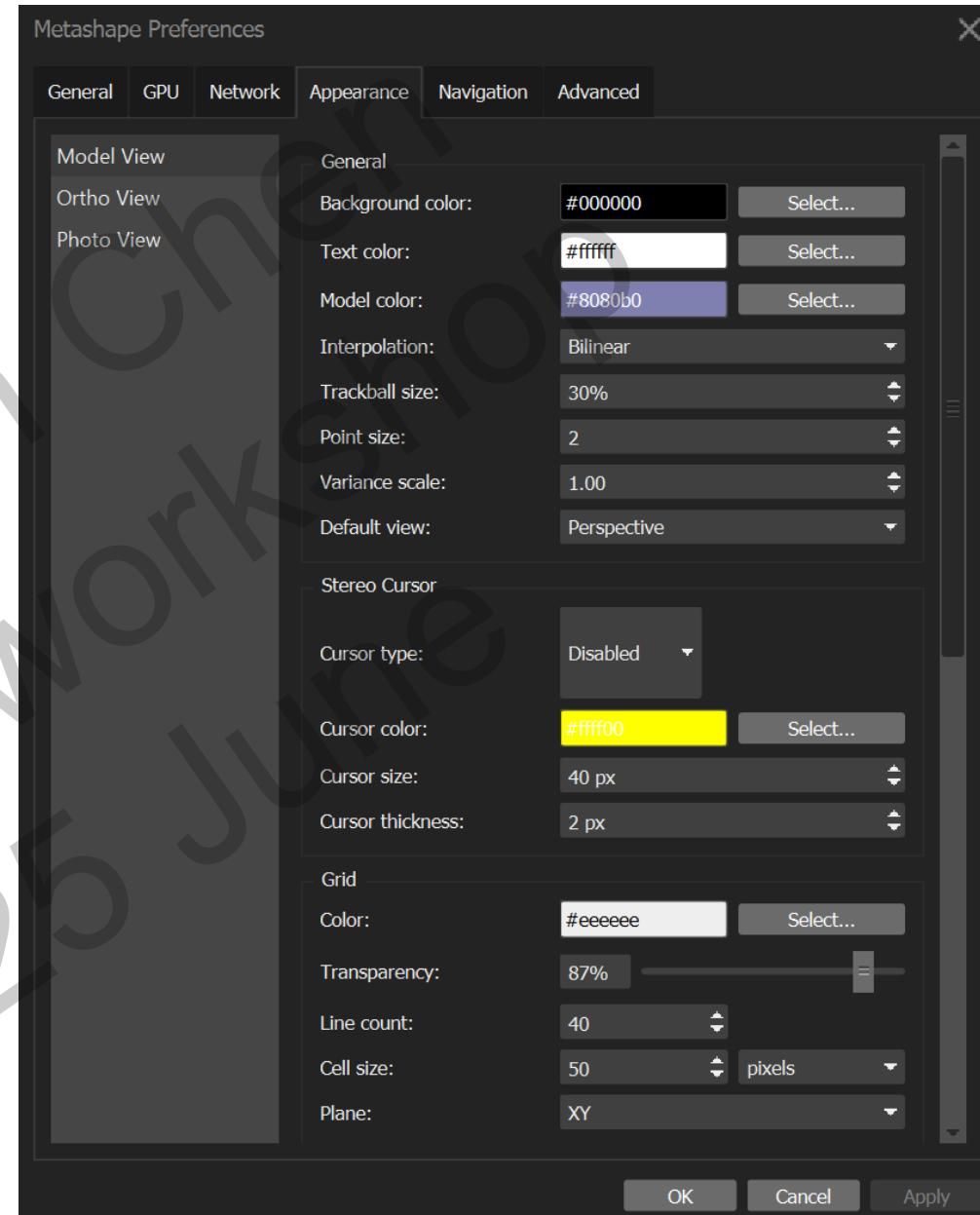
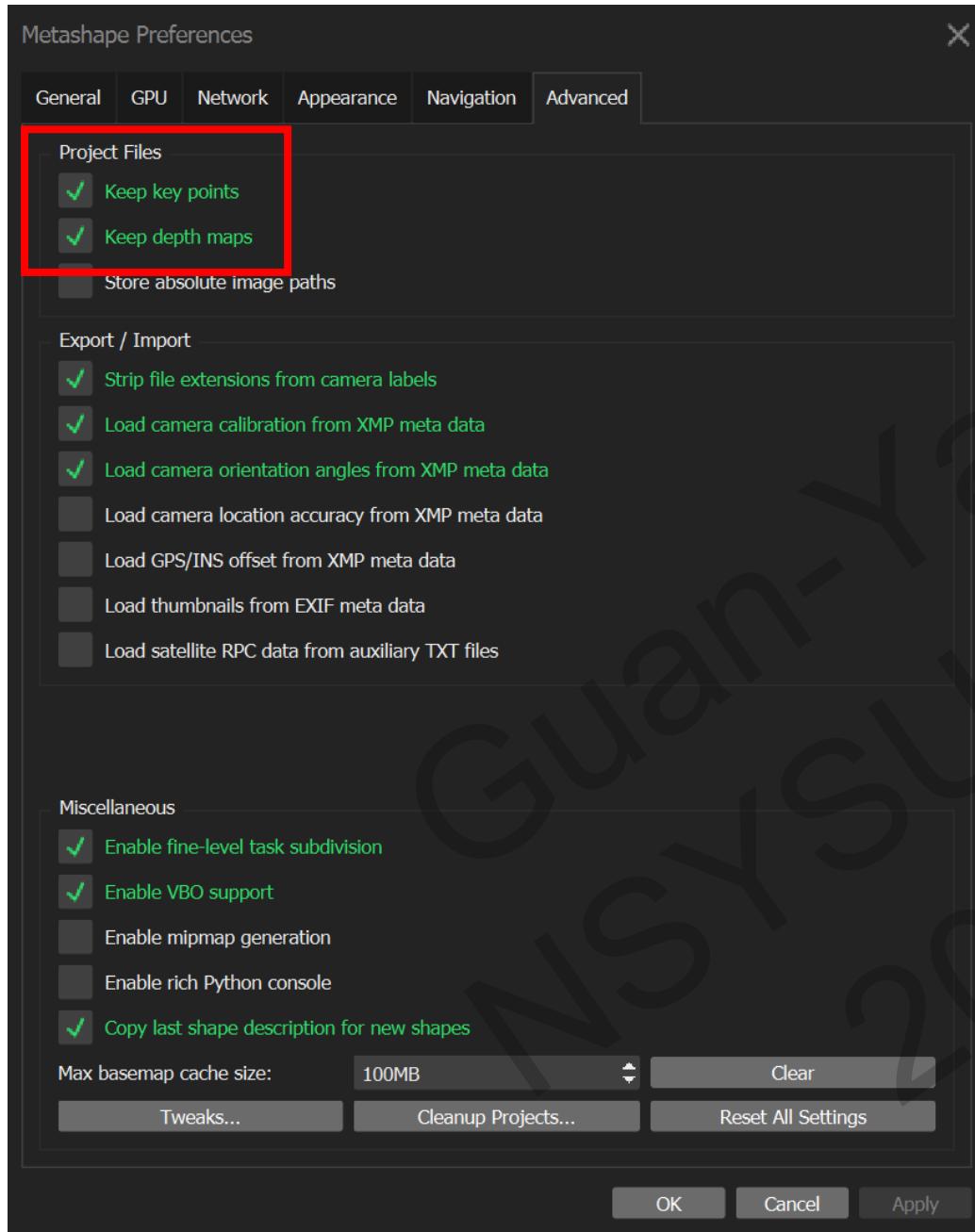
Photos	Label	Size	Aligned	Quality	Date & time	Make	Model	Focal length	Frame	ISO	Shutter	35mm focal	Sensor X res	Sensor Y res	Orientation (°)	Path	En

Workspace Reference

Photos Console Jobs

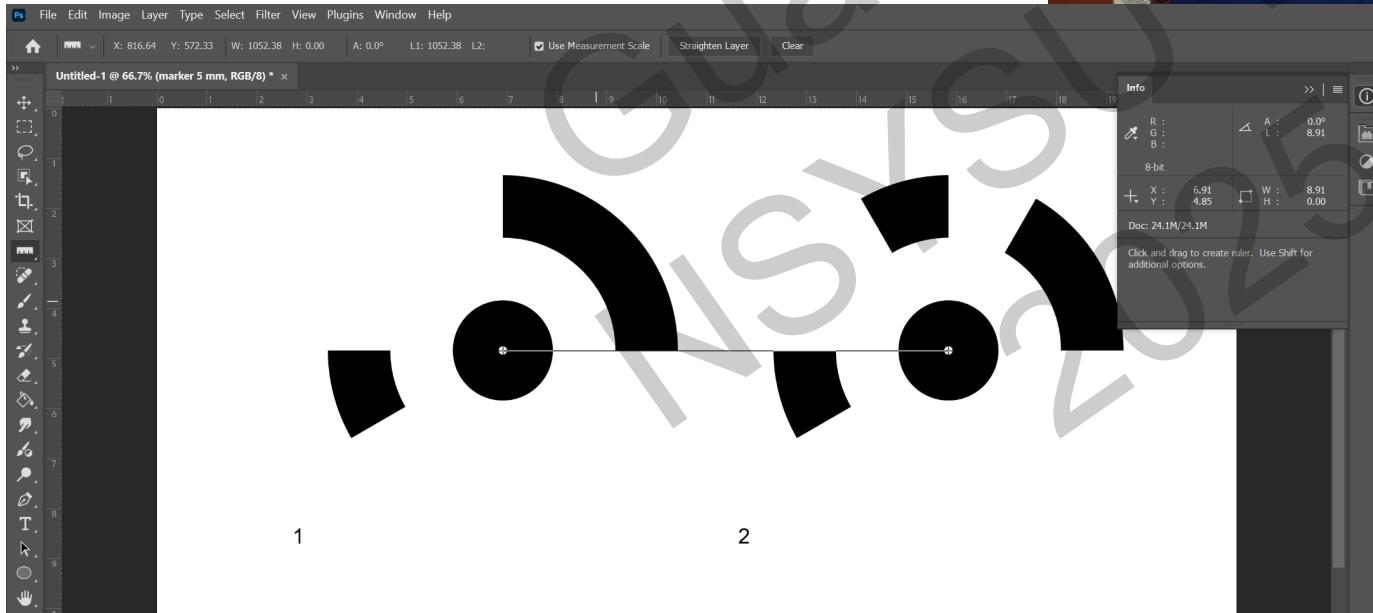
照片匯入區







Ps

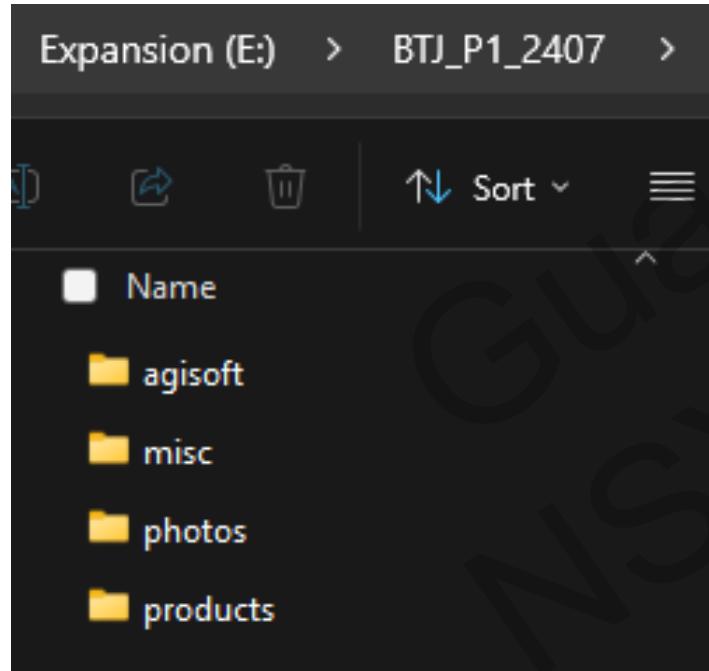


# 資料存放結構與命名

資料夾結構和命名規則要一致，有助於提升未來資料的分析效率

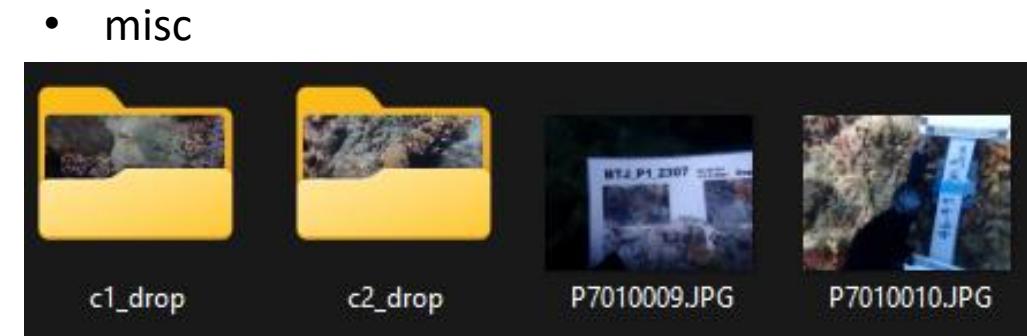
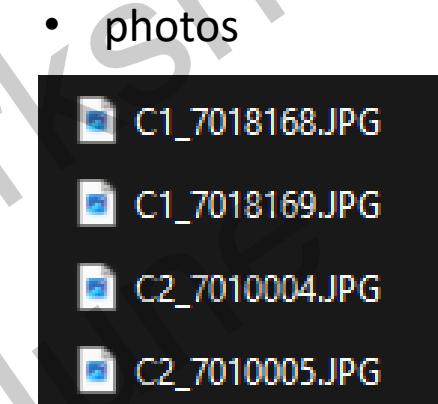
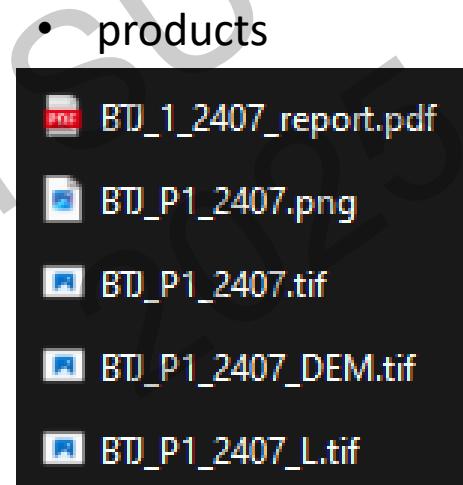
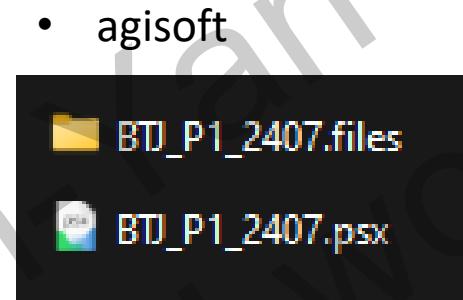
資料夾結構：

專案名稱->地點->日期



命名規則(簡短易讀且富含資訊)

File name: XXX\_ID\_YYMM

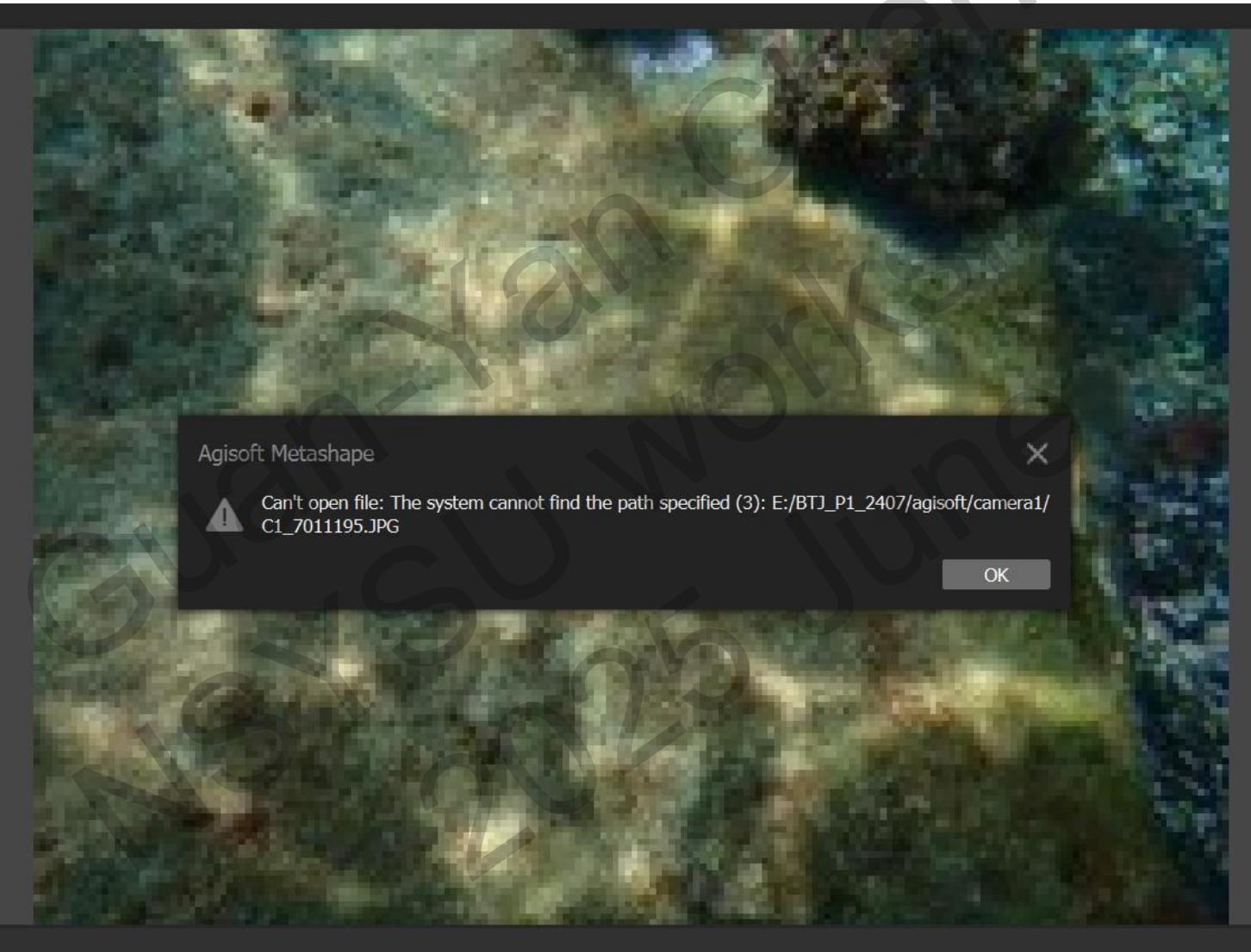


完善的資料管理



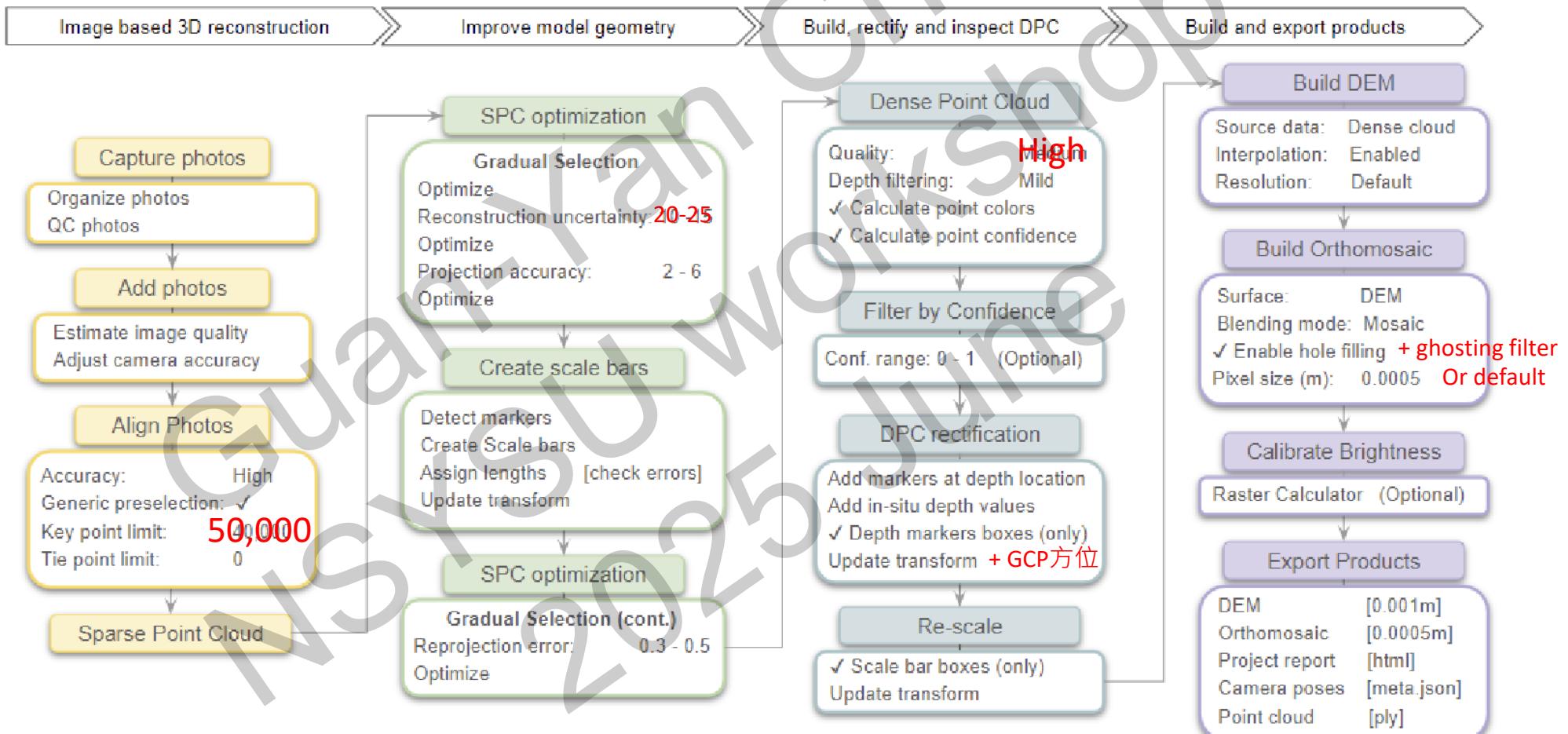
隨便的資料管理

相機資料放一起  
照片依相機編號  
(PowerToys)



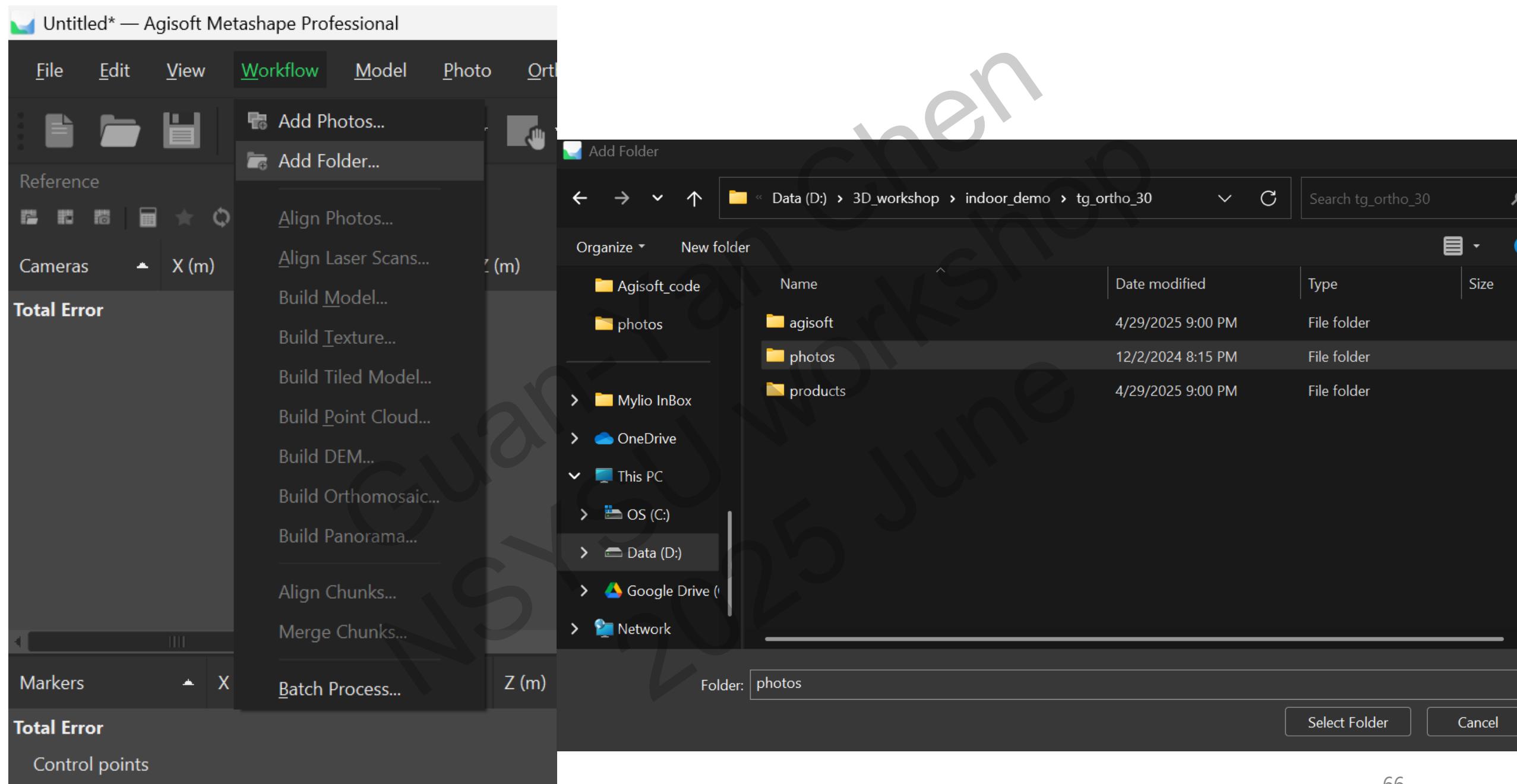
糟糕的資歷結構與命名方式容易遺失檔案無法尋回

# Agisoft 操作流程 (NOAA 2024 SOP)



**Figure 4.1** A schematic workflow of the image based 3D reconstruction and product generation of coral reef scenes through SfM photogrammetry in Agisoft Metashape.

(Damaris et al., 2024)





Workspace

Model Ortho

— □ X

Workspace (1 chunks, 30 images)

Snap: Axis, 3D

Chunk 1 (30 images)

Images (0/30 aligned)

- PC020138, NA
- PC020139, NA
- PC020140, NA
- PC020141, NA
- PC020142, NA
- PC020143, NA
- PC020144, NA
- PC020145, NA
- PC020146, NA
- PC020147, NA
- PC020148, NA
- PC020149, NA
- PC020150, NA
- PC020151, NA
- PC020152, NA
- PC020153, NA
- PC020154, NA
- PC020155, NA
- PC020156, NA
- PC020157, NA

Perspective 30°



Photos



PC020138 PC020139 PC020140 PC020141 PC020142 PC020143 PC020144 PC020145 PC020146 PC020147 PC020148



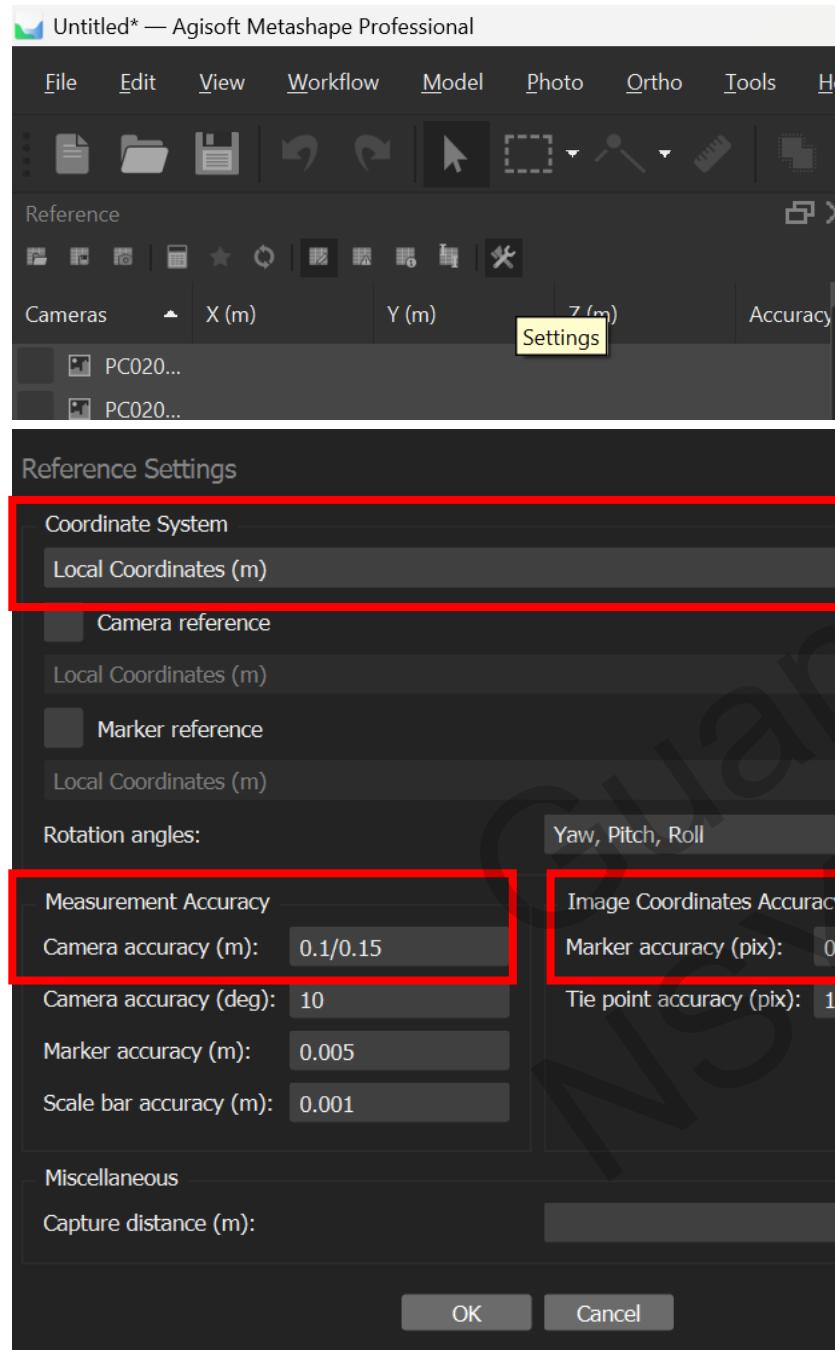
PC020149 PC020150 PC020151 PC020152 PC020153 PC020154 PC020155 PC020156 PC020157 PC020158 PC020159



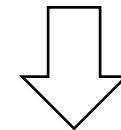
PC020159

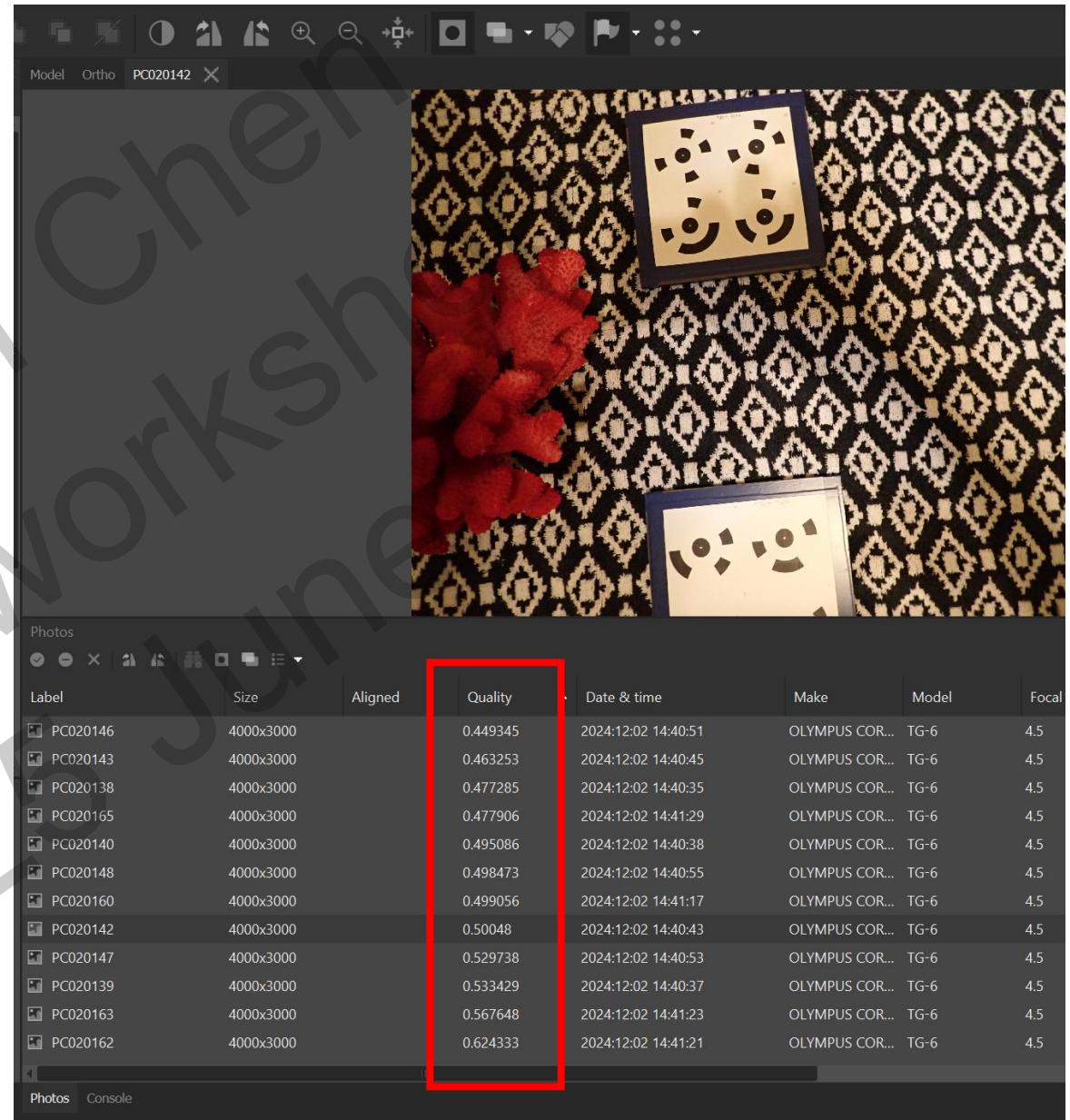
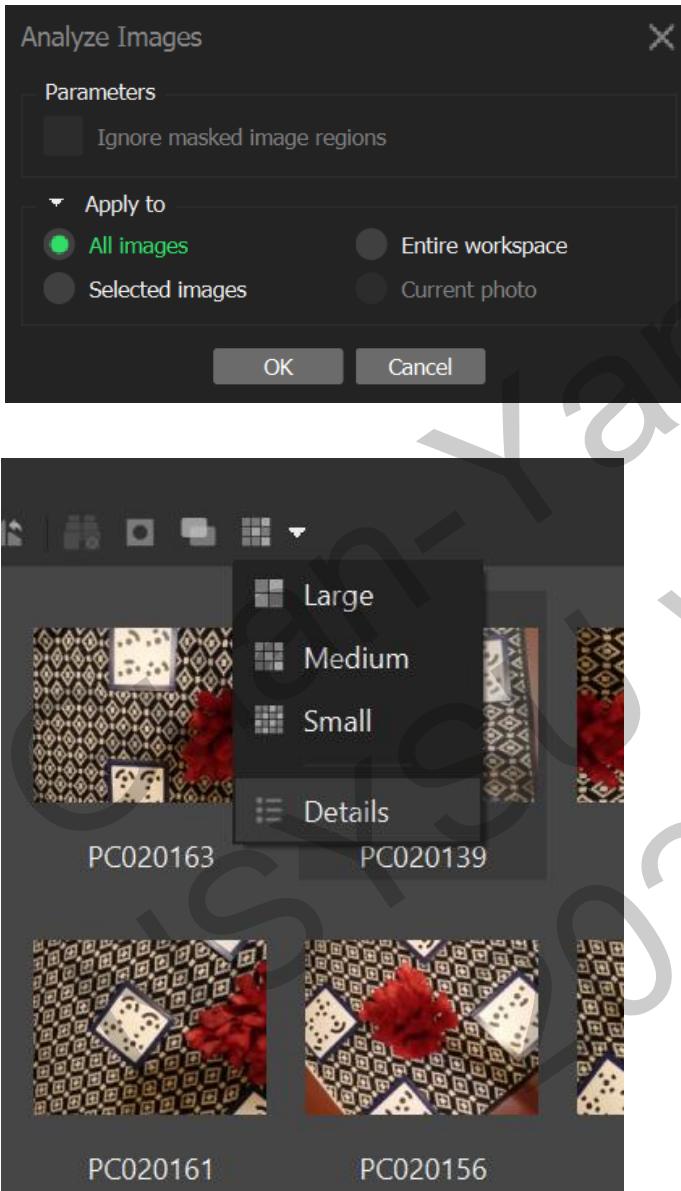
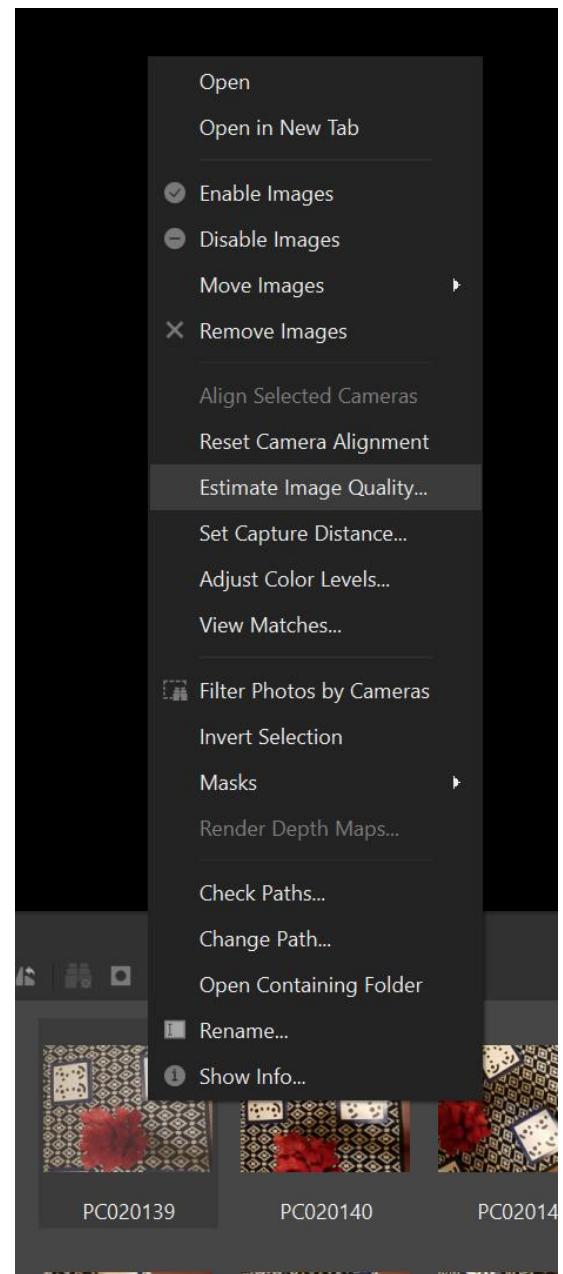
Workspace Reference

Photos Console

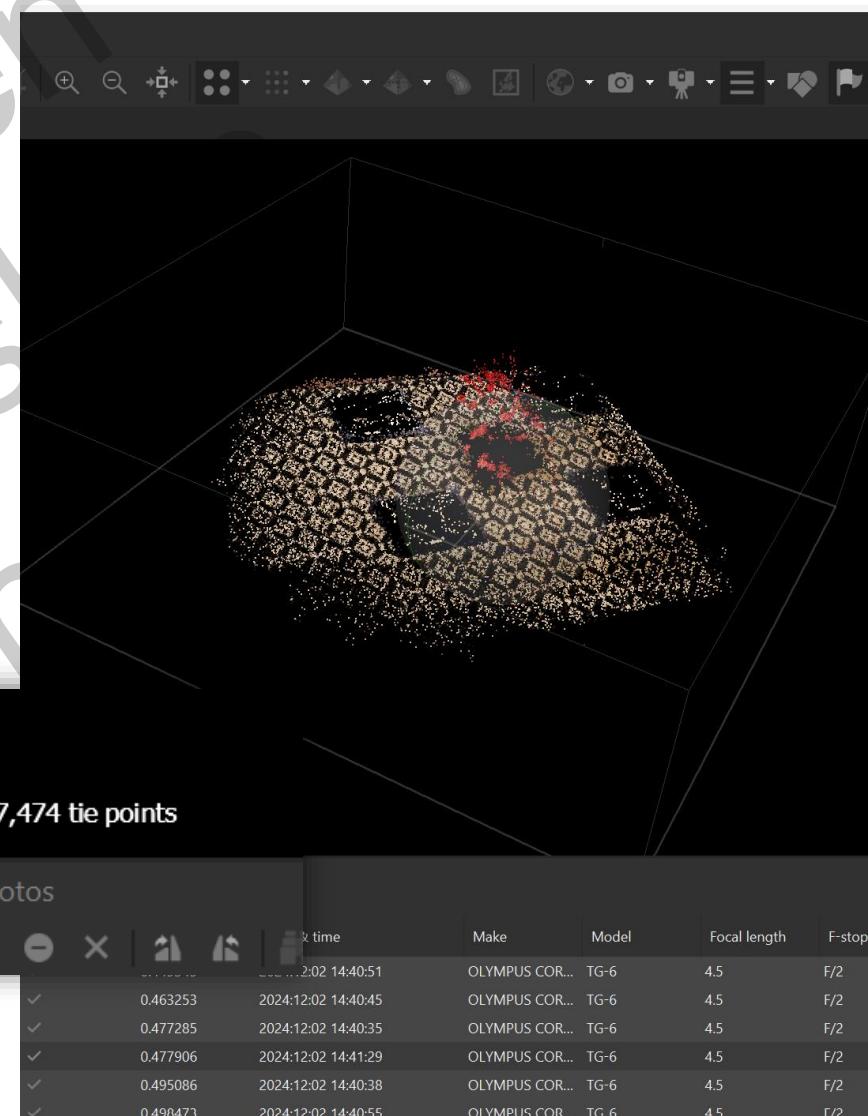
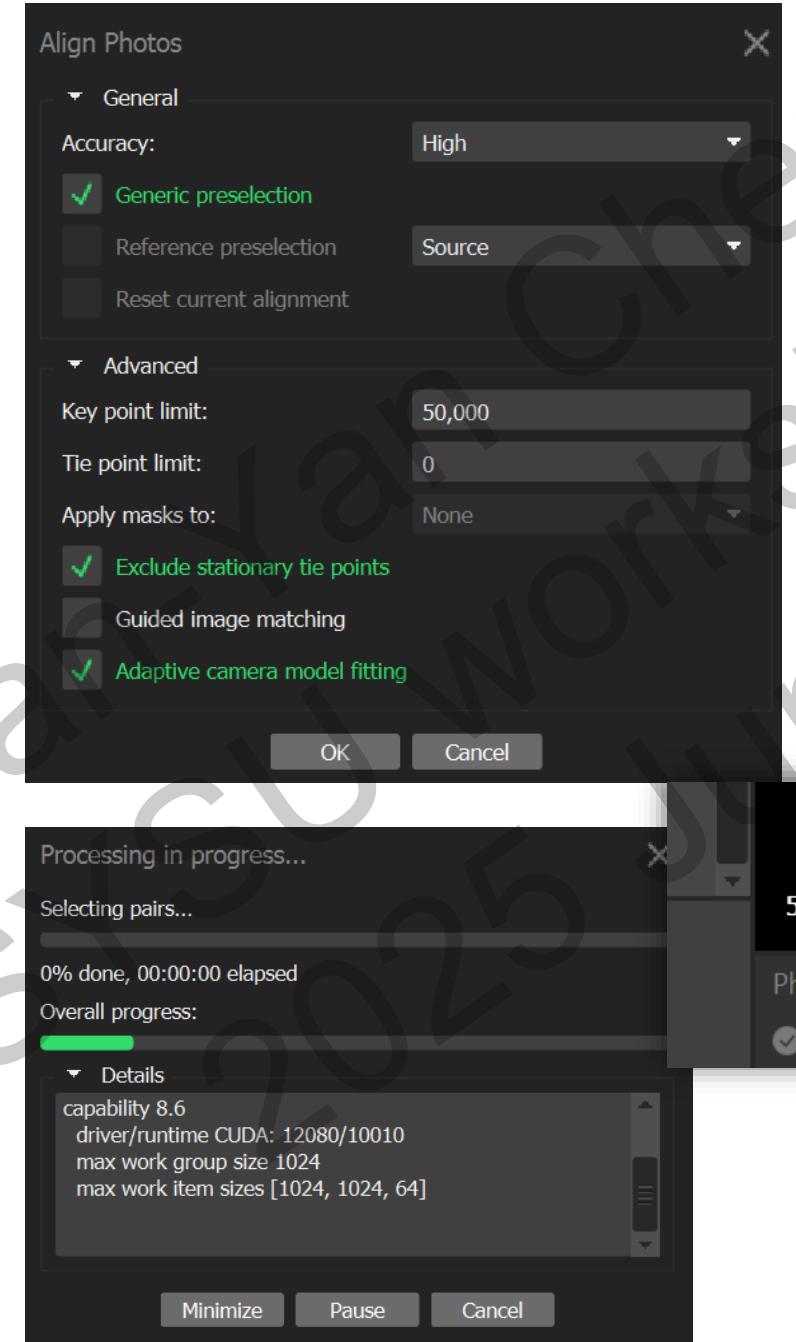
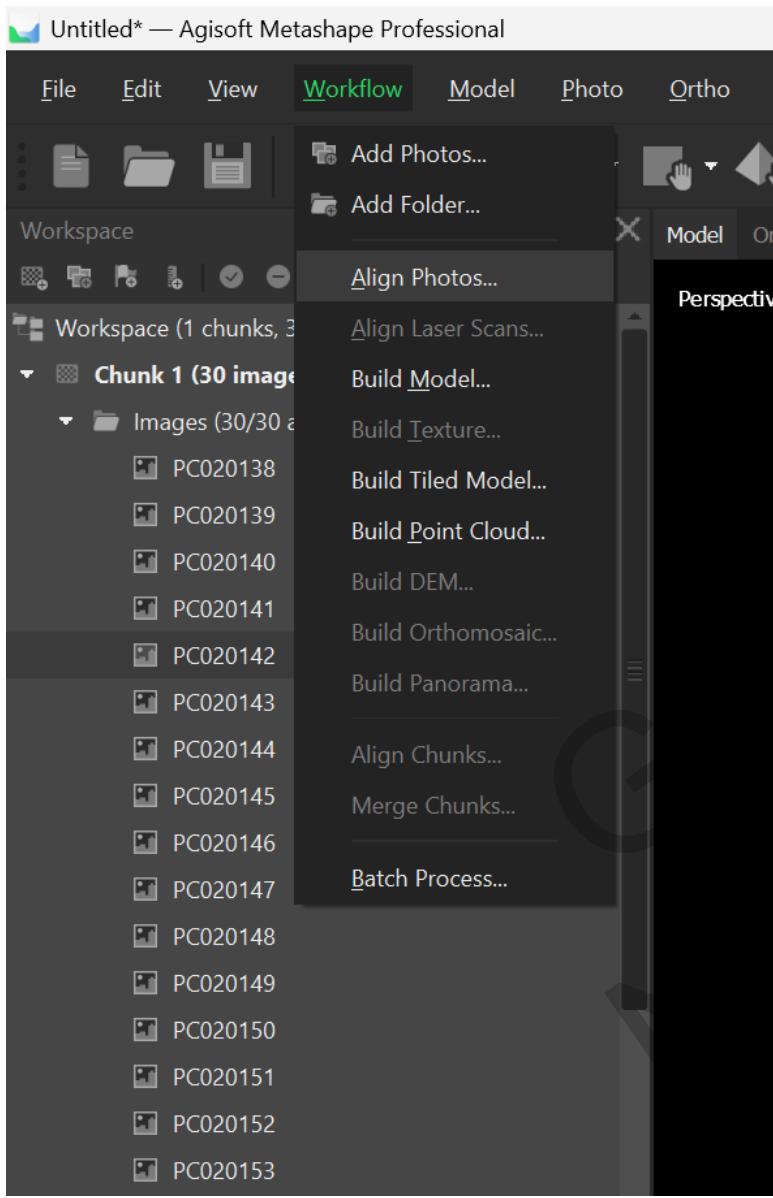


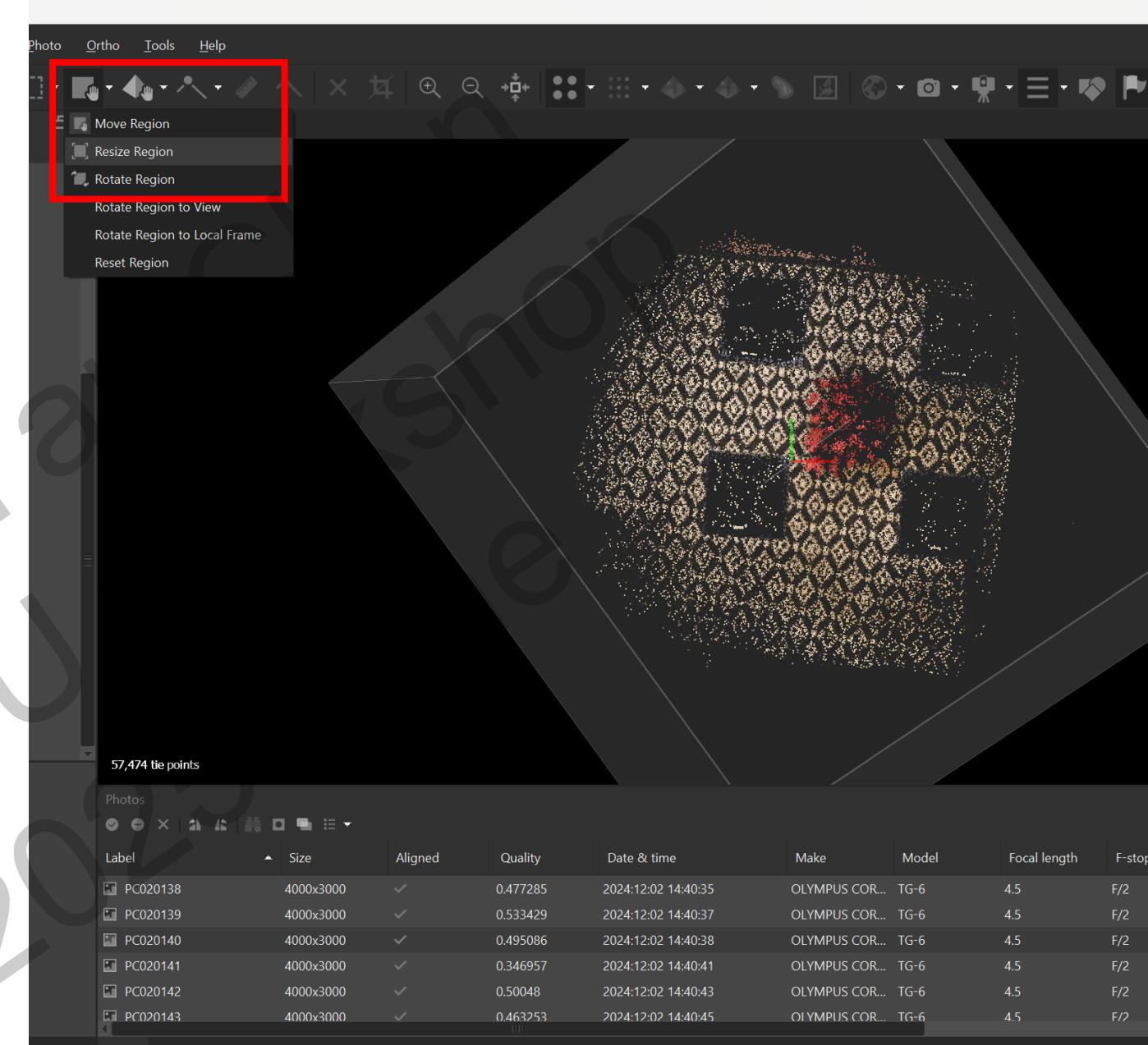
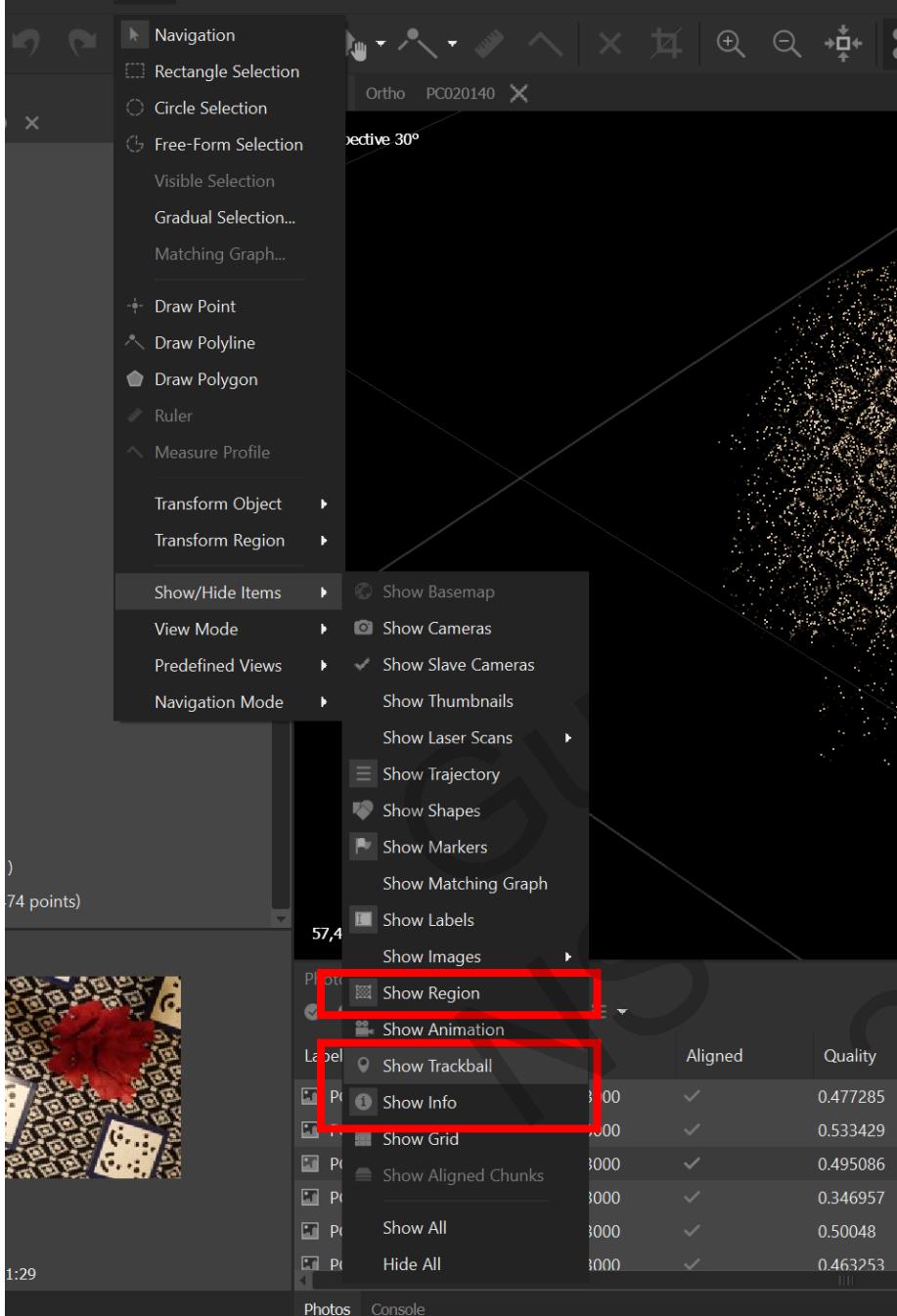
Markers	X (m)	Y (m)	Z (m)	Accuracy (m)
<b>Total Error</b>				
Control points				
Check points				

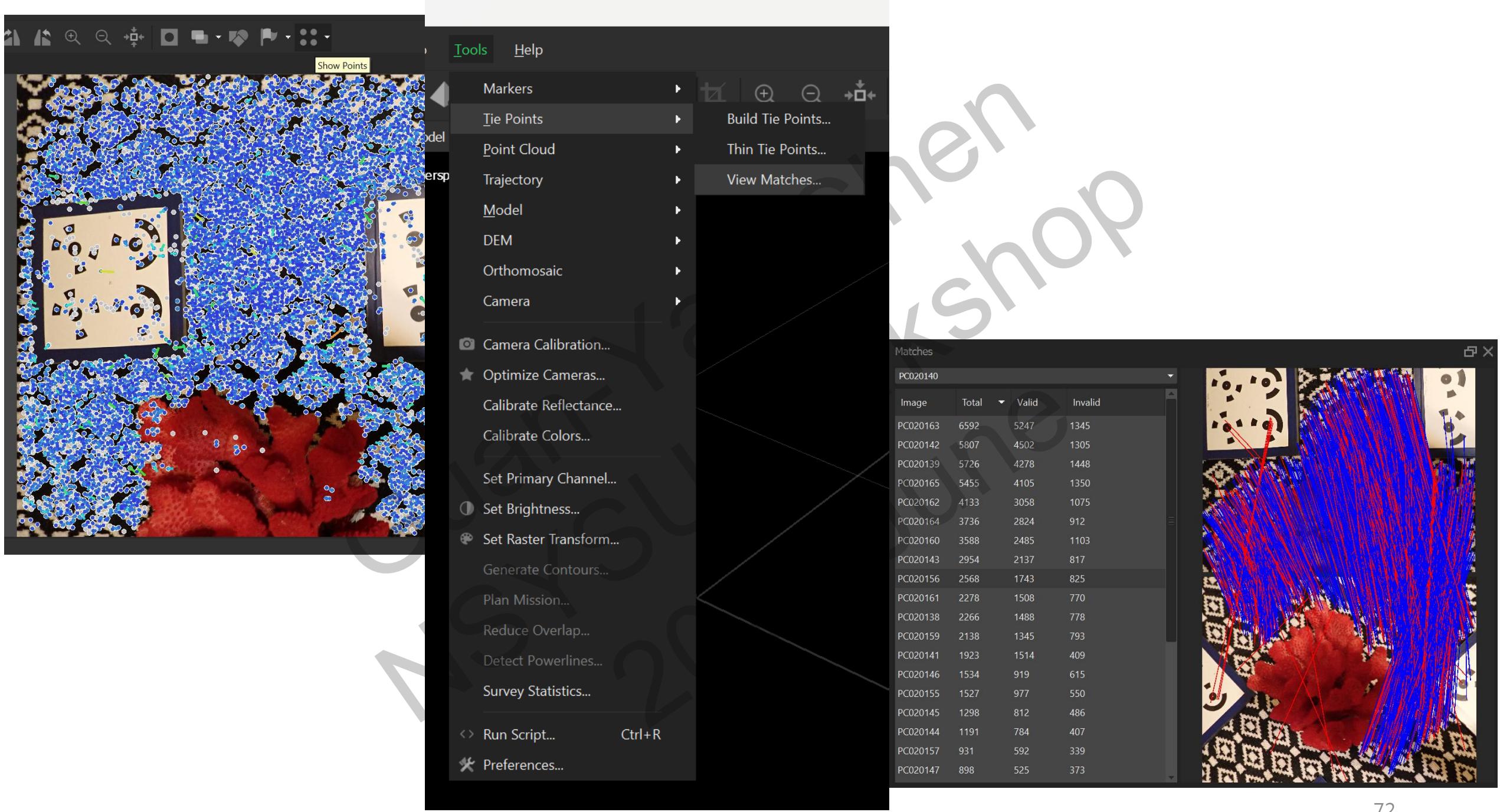


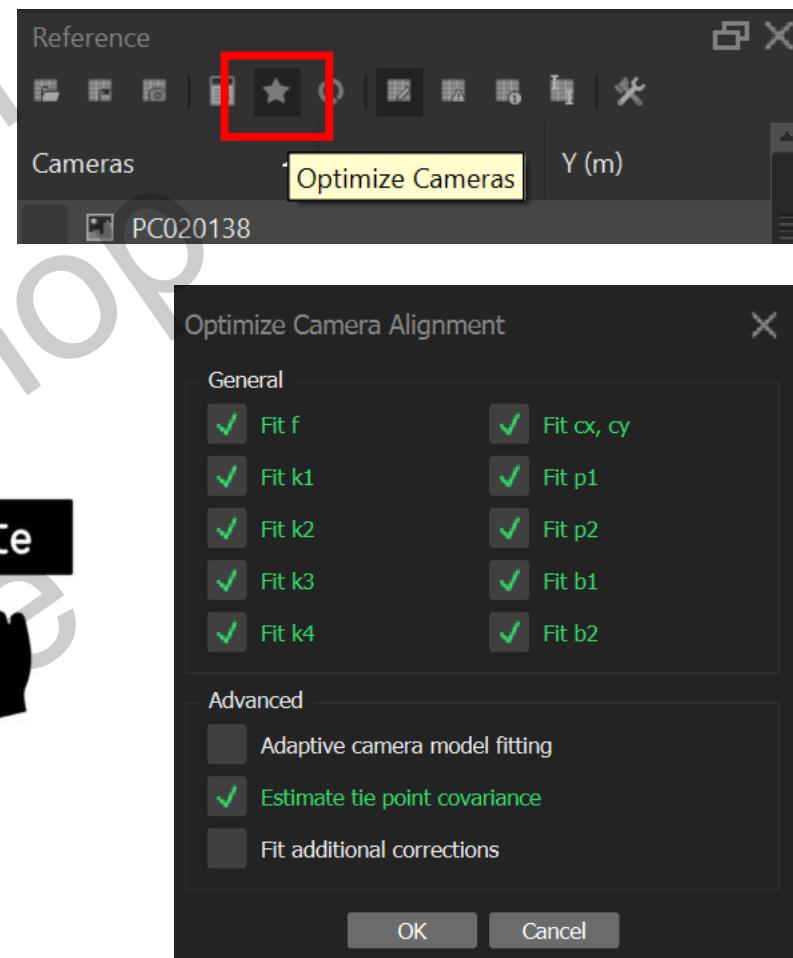
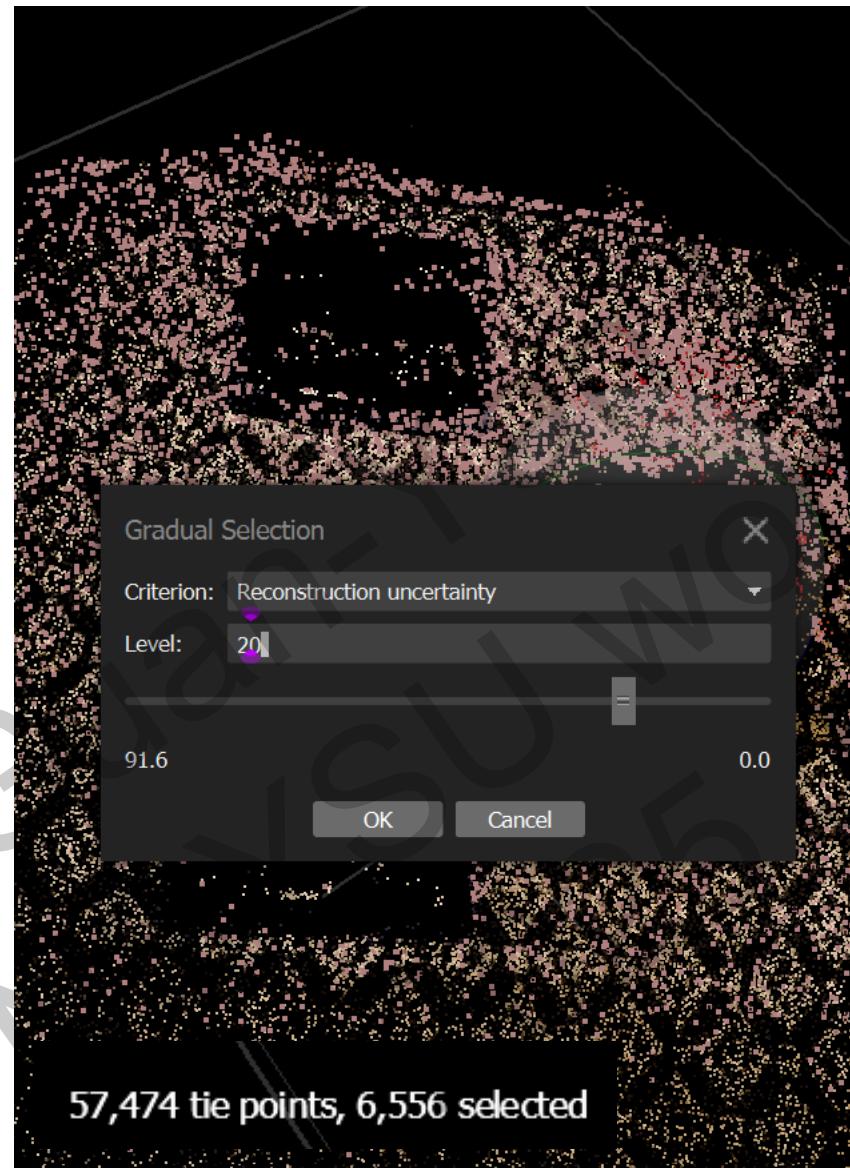
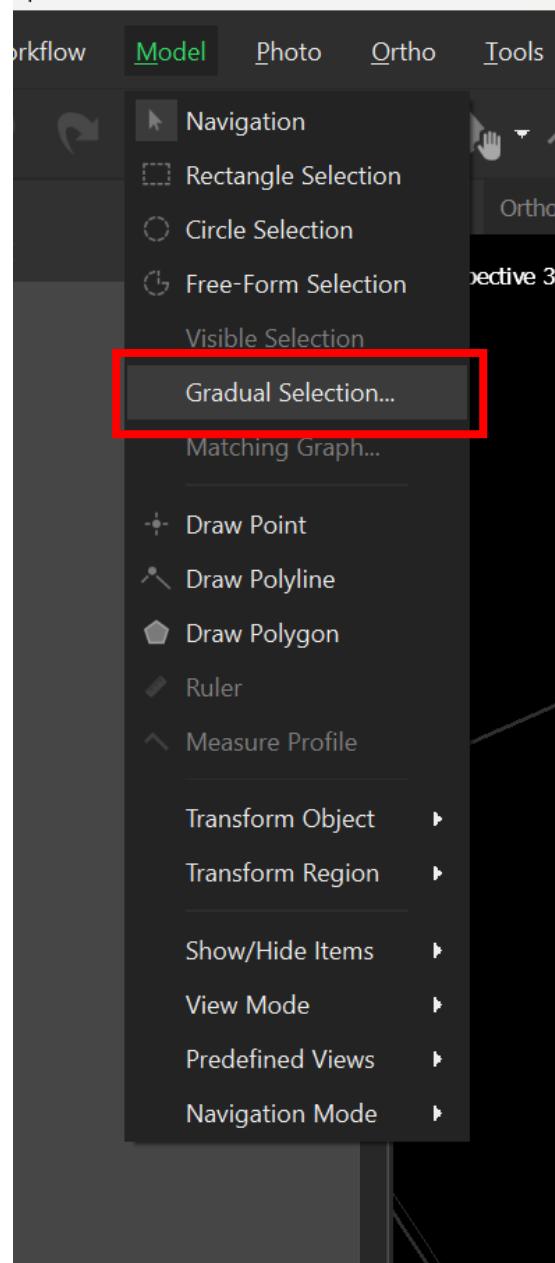


Quality最低門檻視環境而定

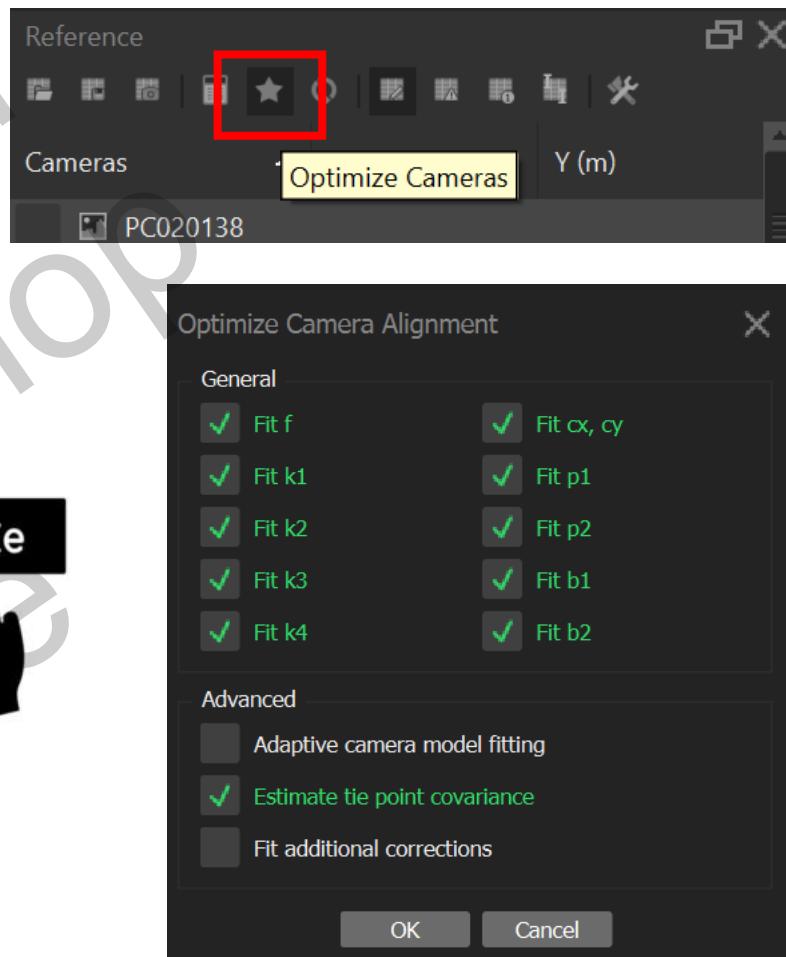
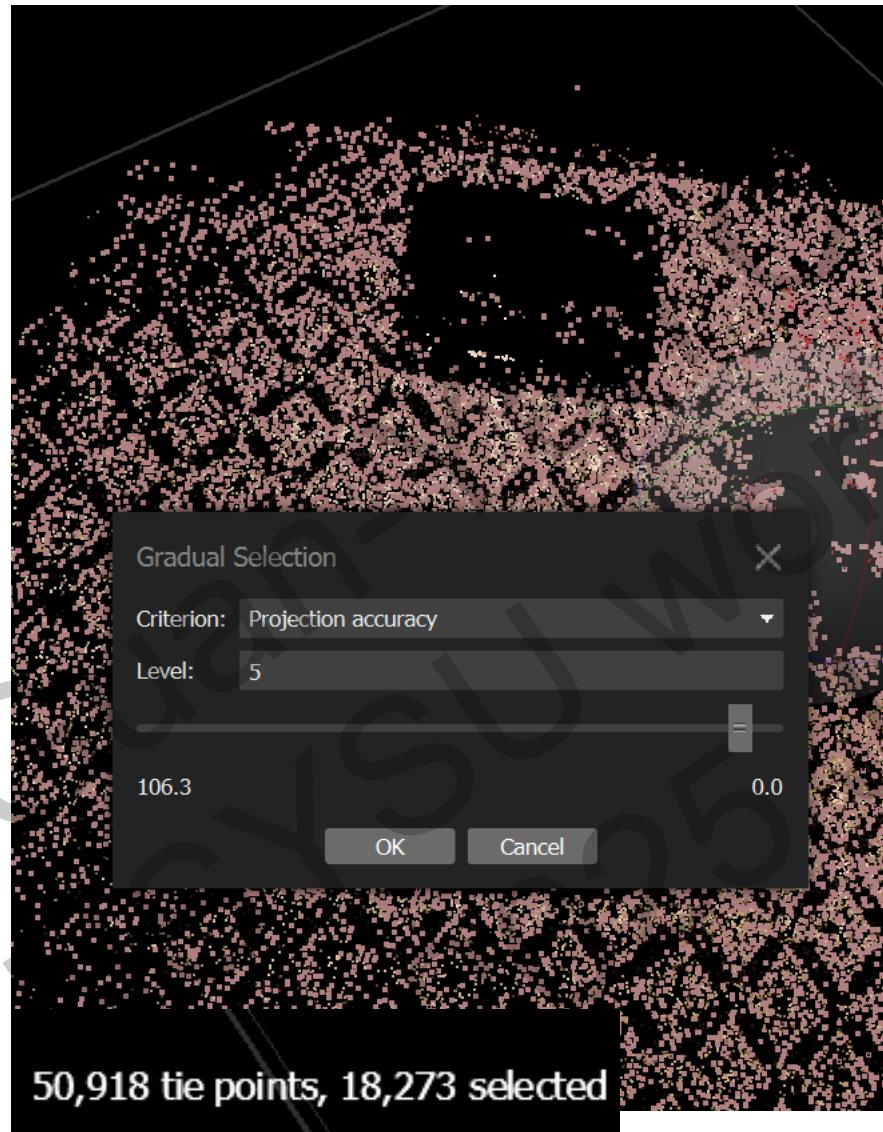
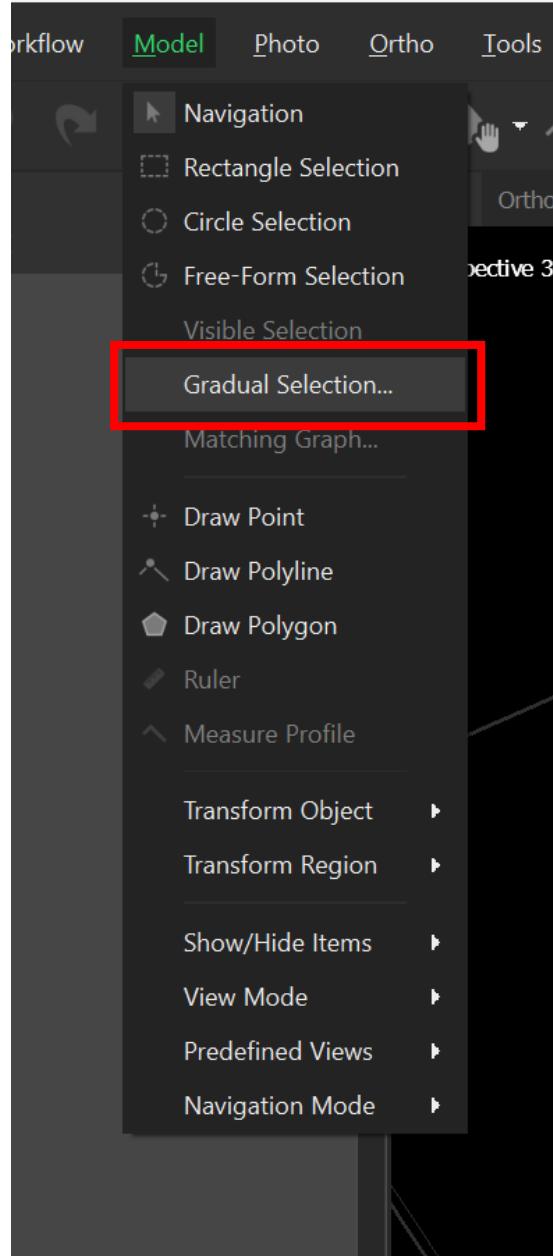






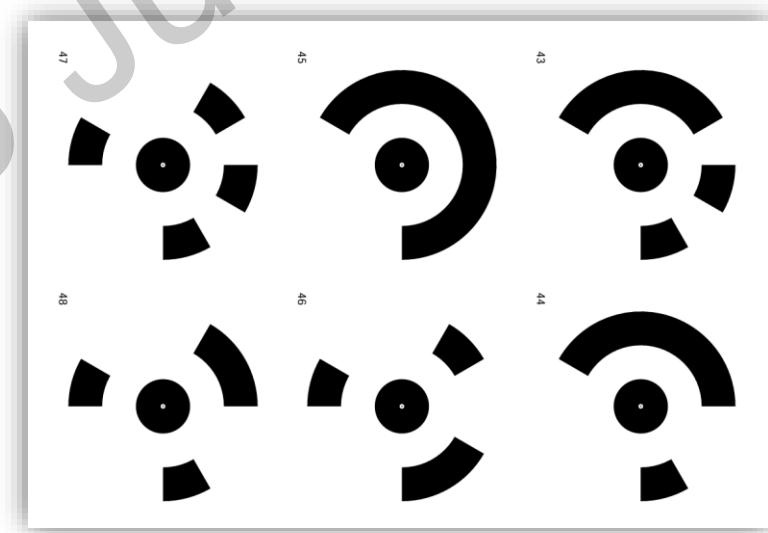
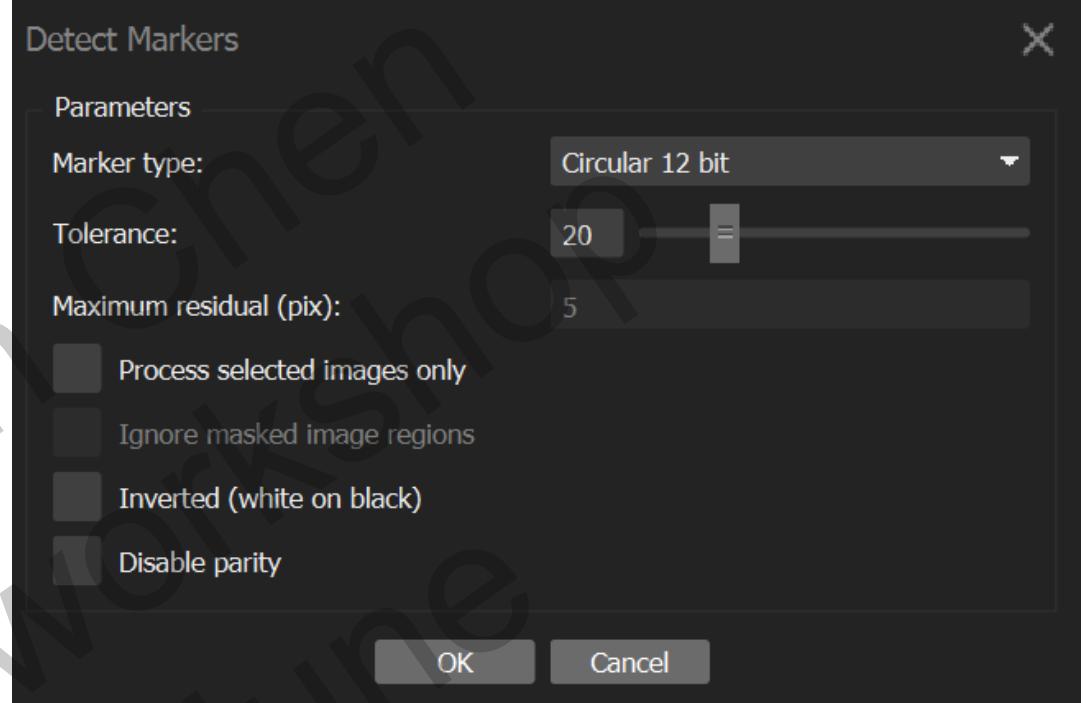
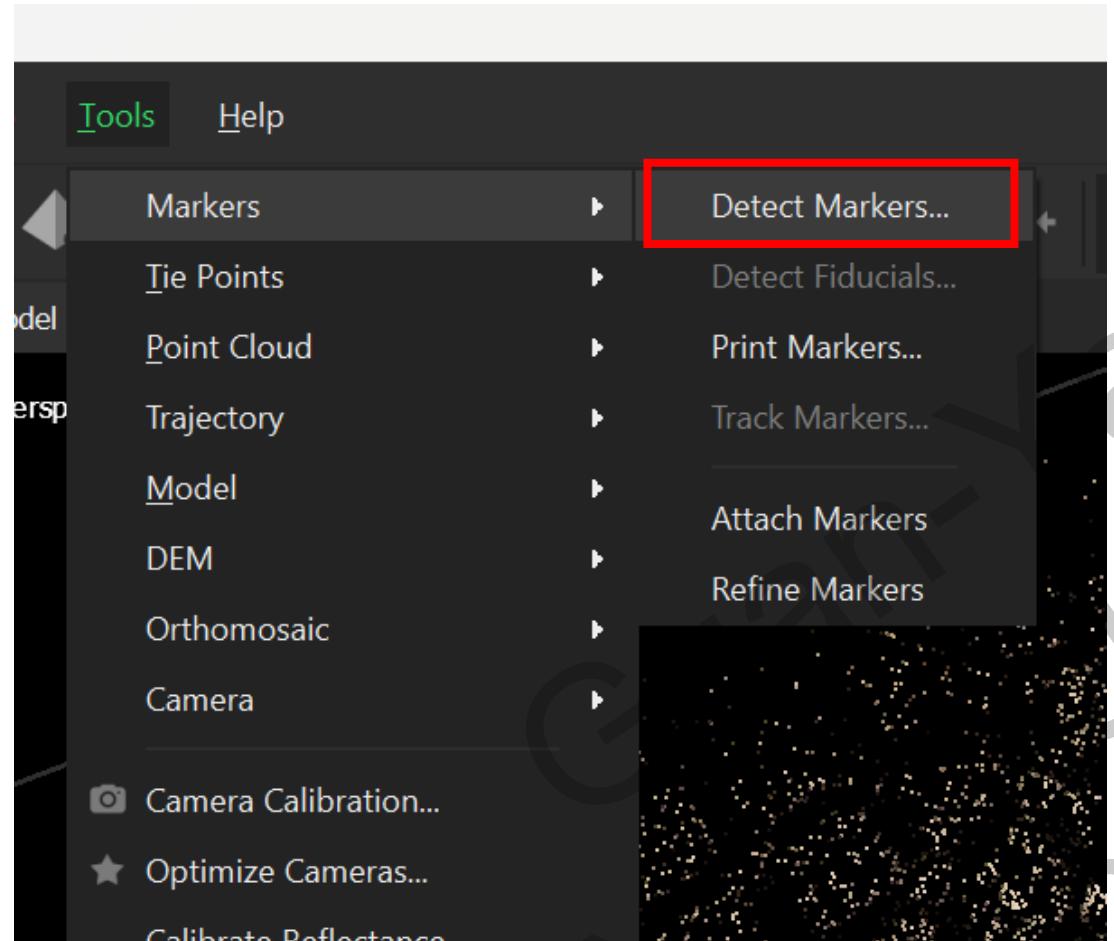


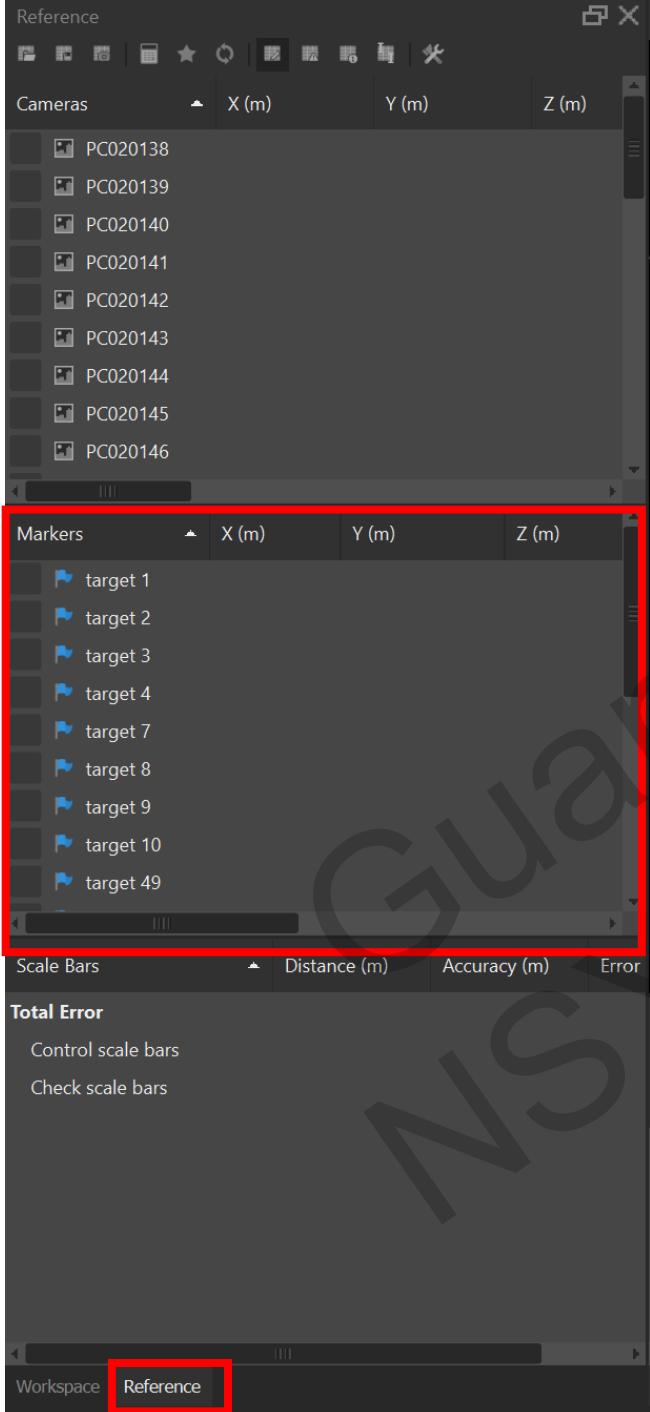
參數	含義
Pixel size (mm)	感測器每個像素的物理尺寸（長 × 高），用來把焦距從「像素」轉成「毫米」。
Focal length (mm)	鏡頭標稱的焦距；在下方 $f$ 參數校正後以像素為單位重新估算。
$f$	校正後的「有效焦距」，以像素(px)為單位。 $= (\text{Focal length} \div \text{Pixel size}) + \text{校正偏移}$
$cx, cy$	主點 (Principal Point) 在影像座標中的位置，單位為像素(px)。通常偏離影像中心即代表光心與感測器中心輕微不對齊。
$k1, k2, k3, k4$	徑向畸變係數 (Radial Distortion) <ul style="list-style-type: none"> <li>- <math>k1</math>：一階（主要）桶／枕形畸變</li> <li>- <math>k2</math>：二階次補償</li> <li>- <math>k3, k4</math>：更高階調整</li> </ul>
$p1, p2$	切向畸變係數 (Tangential Distortion) <p>用來校正鏡頭不完美裝配或感測器傾斜造成的非對稱變形。</p>
$b1, b2$	仿射／傾斜參數 (Affinity/Skew) <p>校正像素非完美正交或成像面輕微切變（例如非正方形像素）。</p>

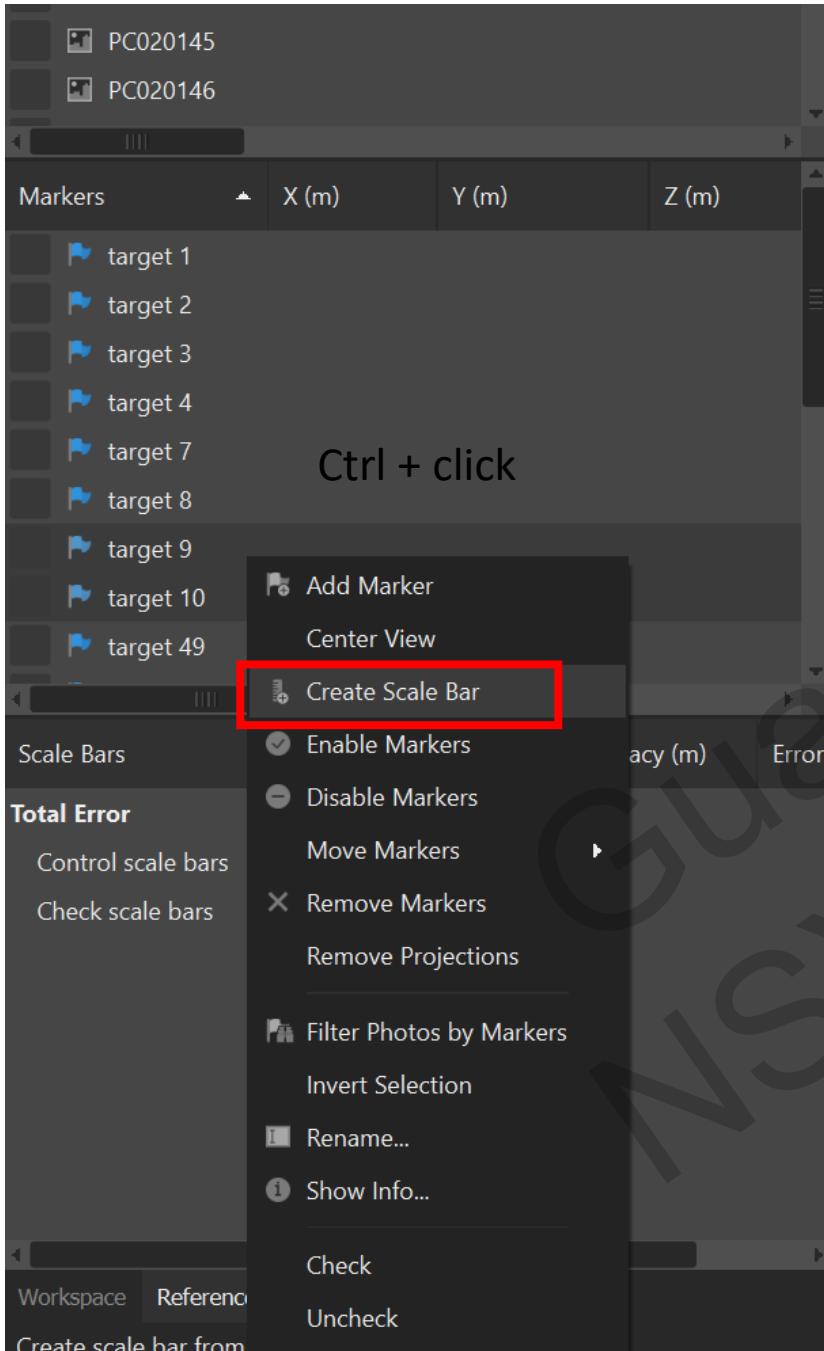


在 Metashape 的 Model → Gradual Selection... 對話框中，你可以依據以下幾項準則逐步篩除品質較差的稀疏點 (tie points)：

選項	含義
<b>Reconstruction uncertainty</b> (重建不確定度)	<ul style="list-style-type: none"><li>衡量某個 3D 點由多張影像光線交匯所造成的位置不確定性，與相機基線長度與角度有關。</li><li>值越大，代表該點在三維空間的定位越不可靠，常見於僅從「相鄰且靠得很近」的相片重建出來的點。</li></ul>
<b>Projection accuracy</b> (投影精度)	<ul style="list-style-type: none"><li>衡量該點在單張影像中與其周圍鄰點共同擬合後的位置穩定度，凡局部紋理或對比度不足的區域此值會偏高。</li><li>大值往往意味著此點的匹配在影像平面上不夠準確。</li></ul>
<b>Reprojection error</b> (重投影誤差)	<ul style="list-style-type: none"><li>將重建出的 3D 點重新投影回原始影像，與最初偵測到的 key-point 位置之間的像素距離。</li><li>值越大通常代表「假匹配」或「定位不準」，是最常用的野點剔除依據。</li></ul>
<b>Image count</b> (圖像數量)	<ul style="list-style-type: none"><li>該 3D 點被成功匹配到的影像張數（至少要 <math>\geq 2</math> 張才能重建）。</li><li>張數越少（2–3 張）代表不夠冗餘，定位精度較差；通常會先剔除出現在極少張影像中的點。</li></ul>







A screenshot of a software interface showing a table titled 'Scale Bars'. The columns are 'Distance (m)', 'Accuracy (m)', and 'Error (m)'. Three rows are listed, all with green checkmarks:

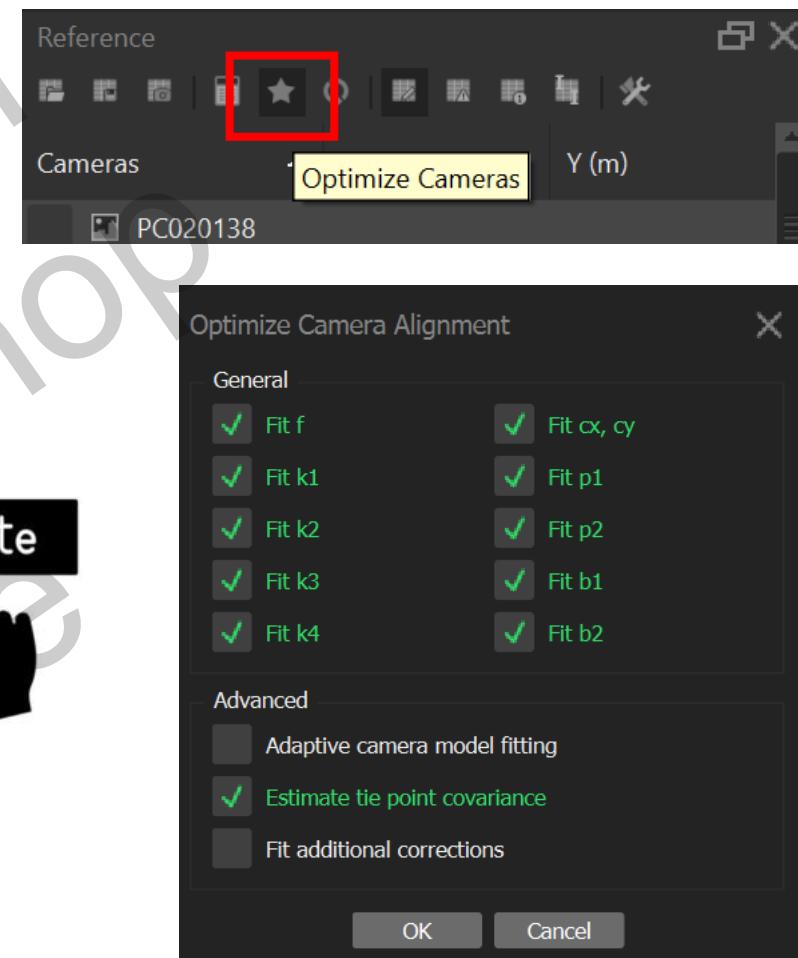
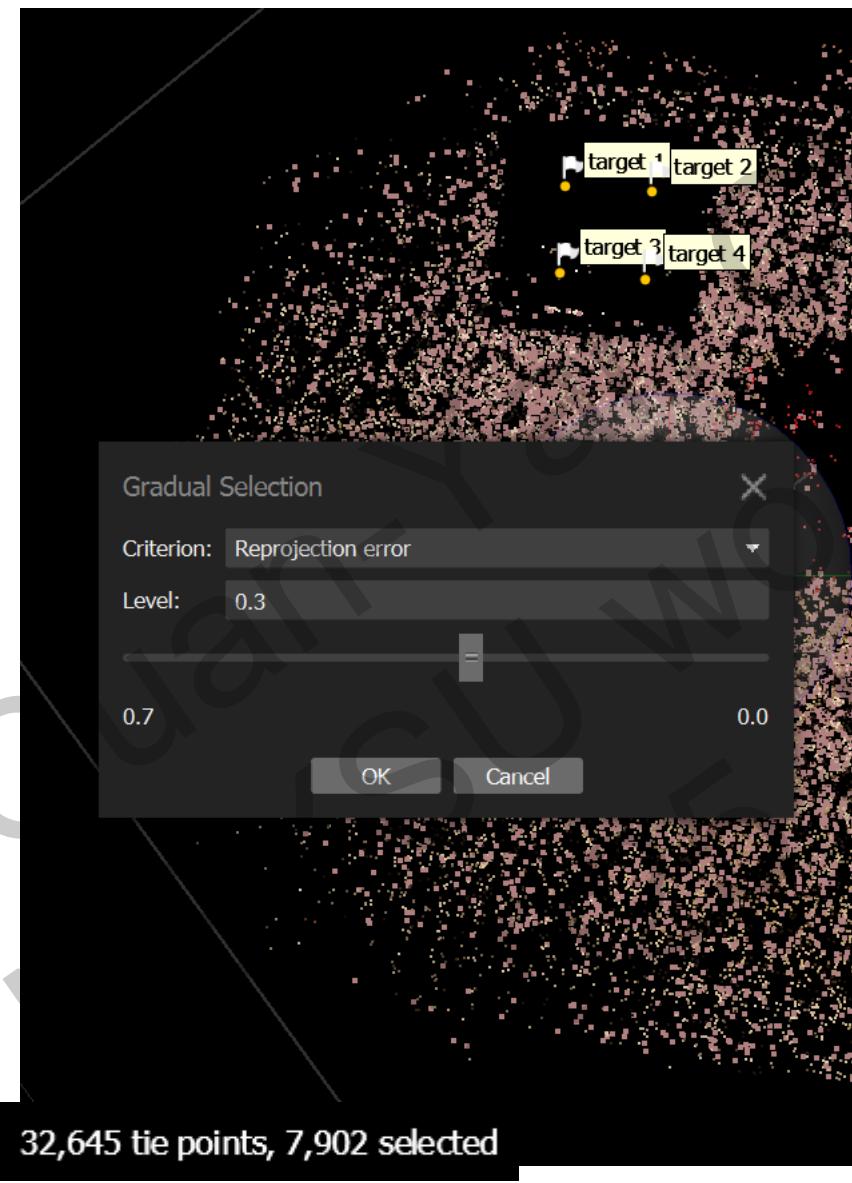
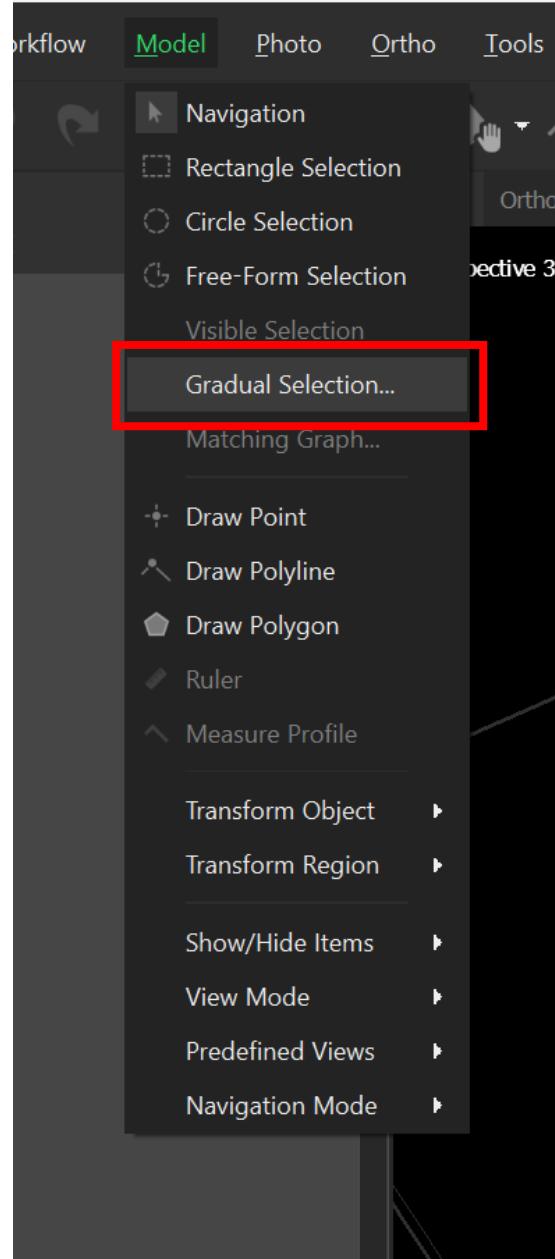
	Distance (m)	Accuracy (m)	Error (m)
target 9_target 10	0.058200	0.001000	
target 49_target 50	0.055800	0.001000	
target 55_target 56	0.055600	0.001000	

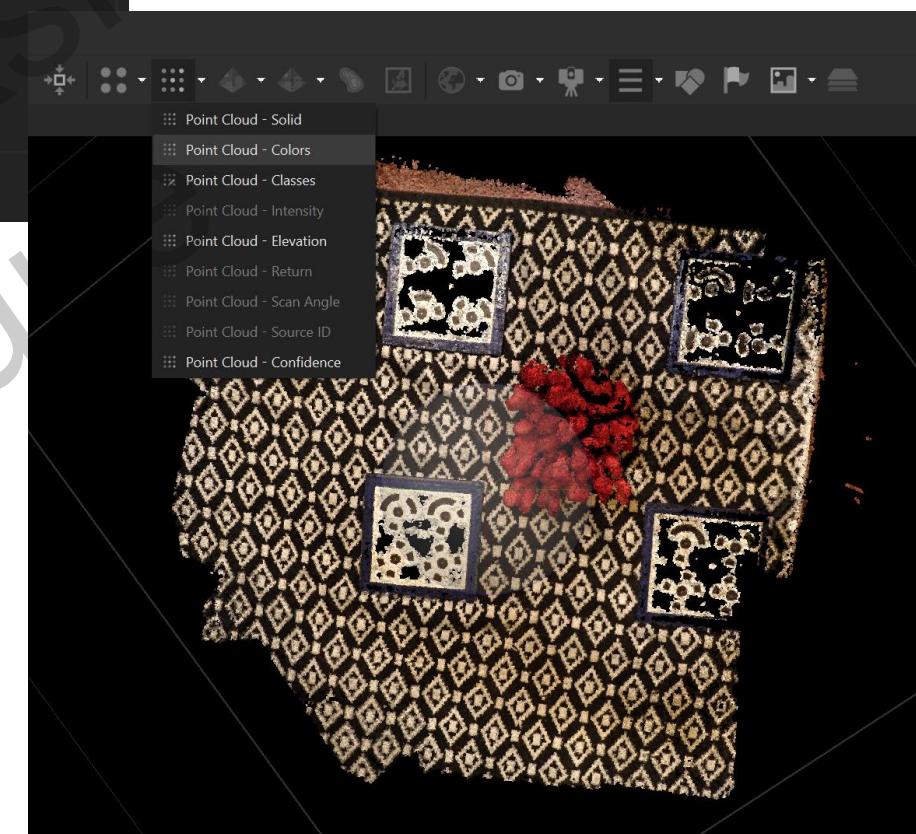
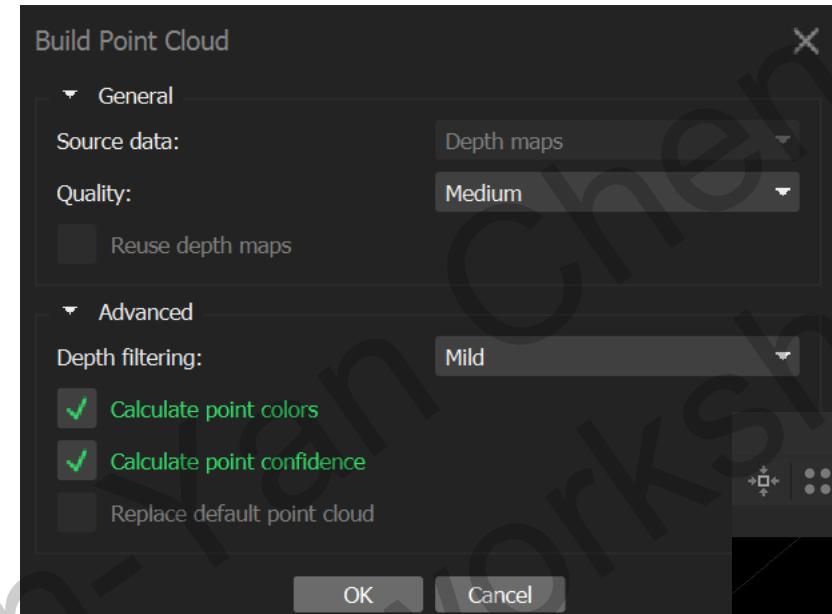
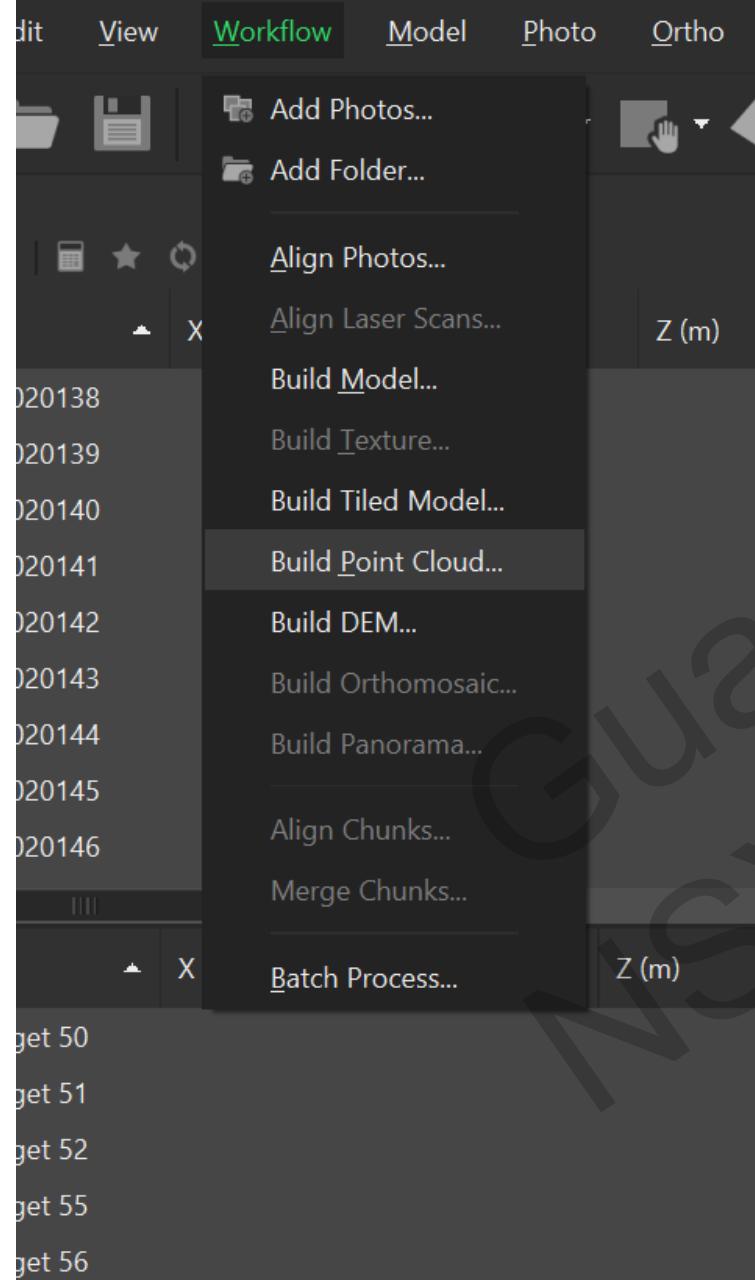
A screenshot of a software interface showing a 'Reference' section with icons and a 'Cameras' section listing 'PC020138' and 'PC020139'. Below the cameras is a yellow-highlighted text field labeled 'Update Transform' with '(m)' next to it. A large white arrow points downwards from the 'Create Scale Bar' menu item to this field.

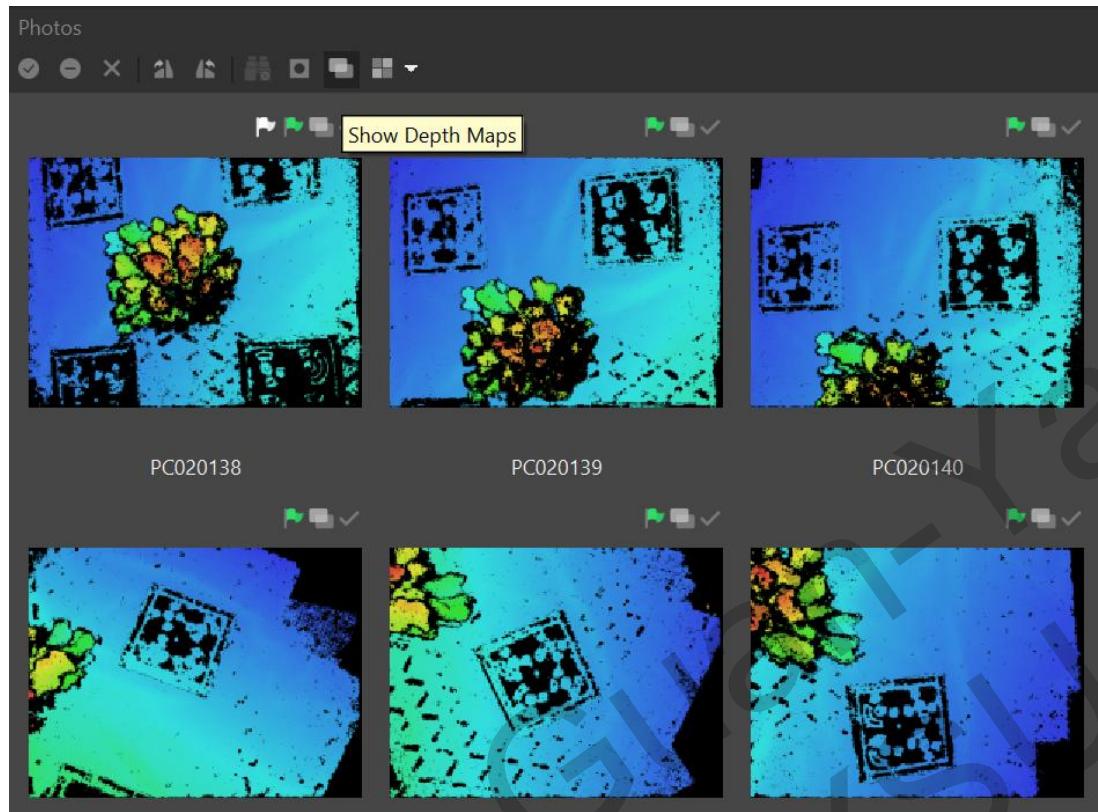
A screenshot of a software interface showing a table titled 'Scale Bars'. The columns are 'Distance (m)', 'Accuracy (m)', and 'Error (m)'. The same three rows as before are listed, but the 'Error (m)' values have been updated:

	Distance (m)	Accuracy (m)	Error (m)
target 9_target 10	0.058200	0.001000	-0.000255
target 49_target 50	0.055800	0.001000	0.000055
target 55_target 56	0.055600	0.001000	0.000210

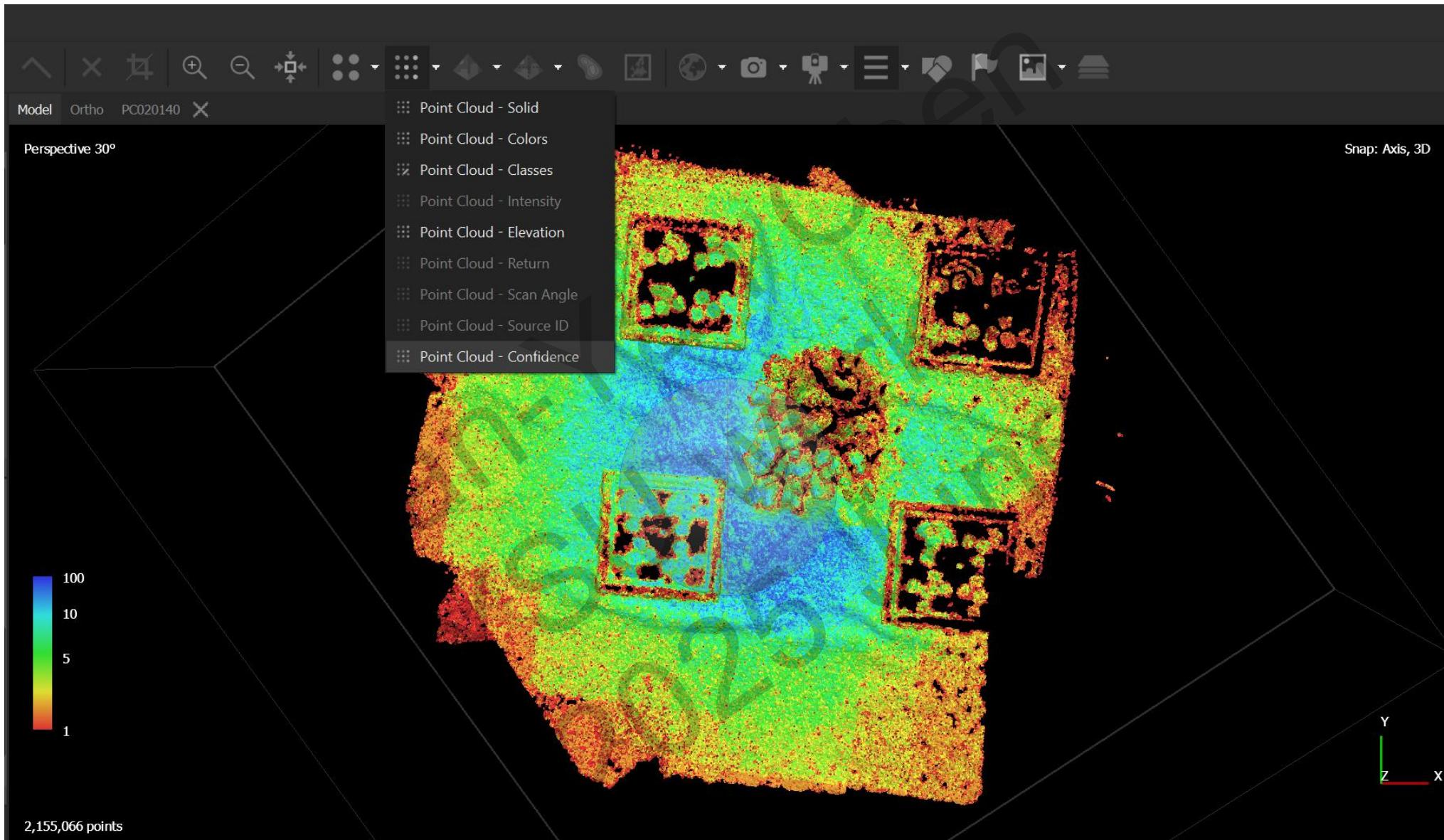
Below the table, under 'Total Error', the 'Check scale bars' value is shown as 0.000193. A large white arrow points downwards from the 'Update Transform' field to the 'Check scale bars' value.

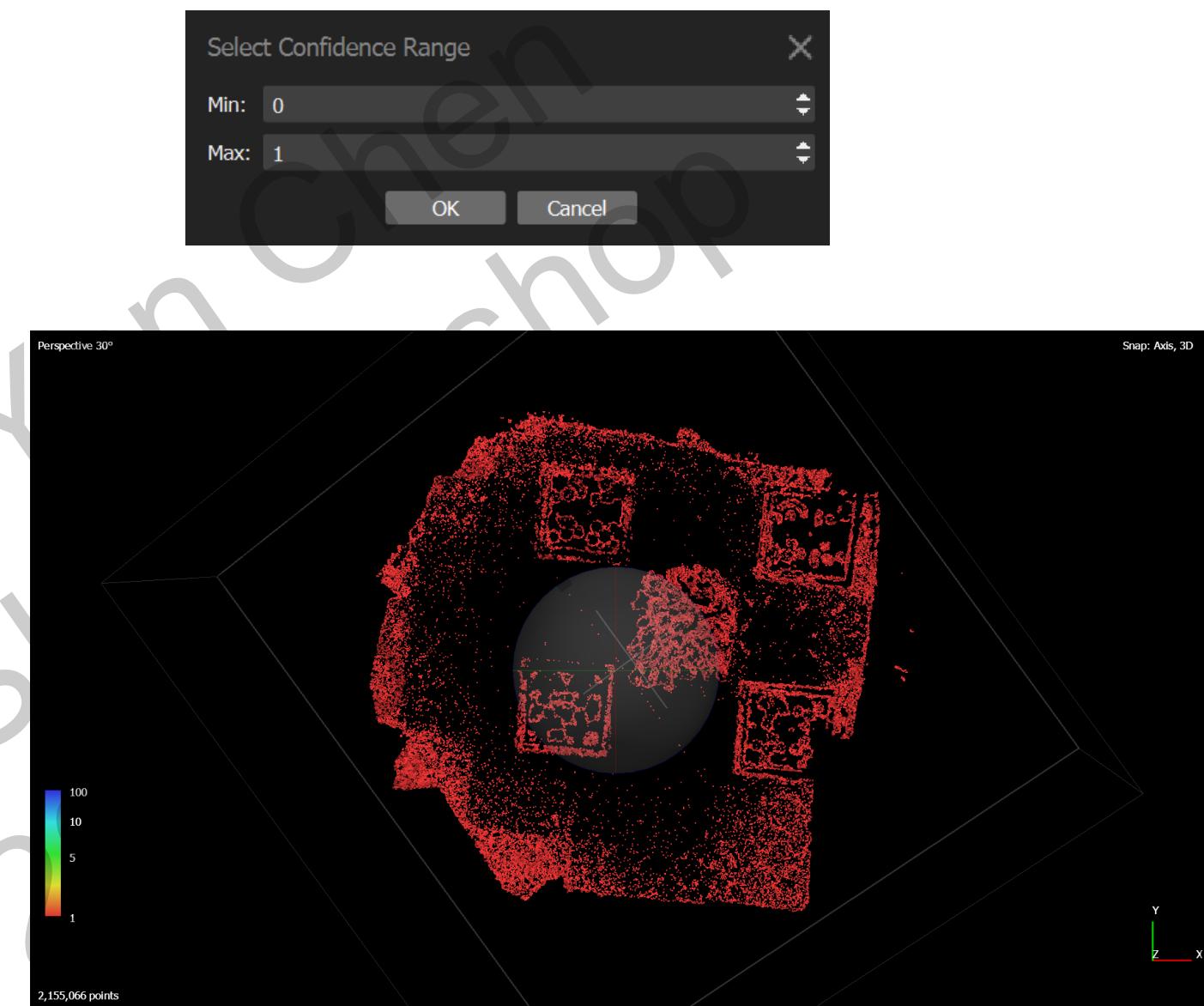
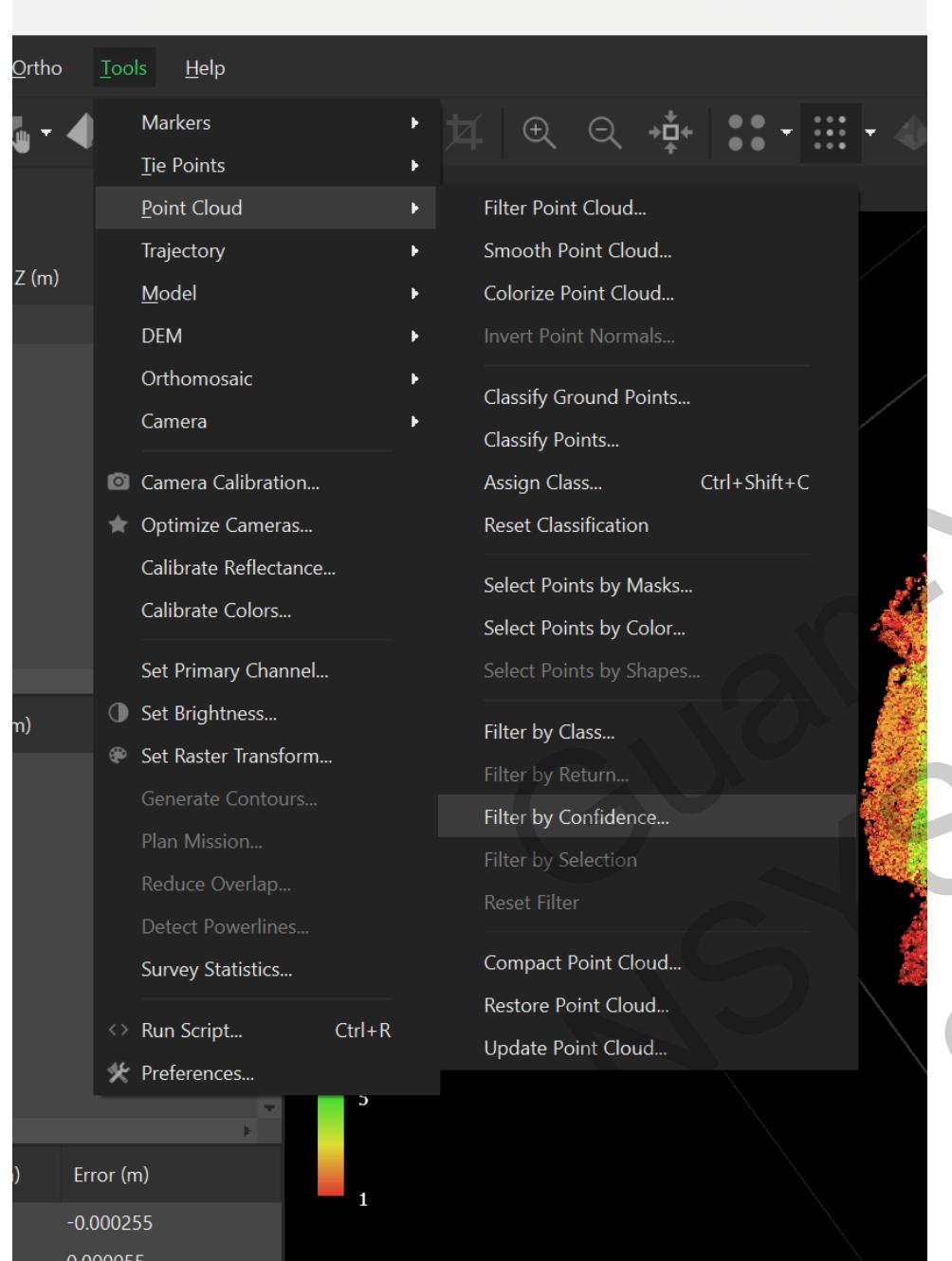


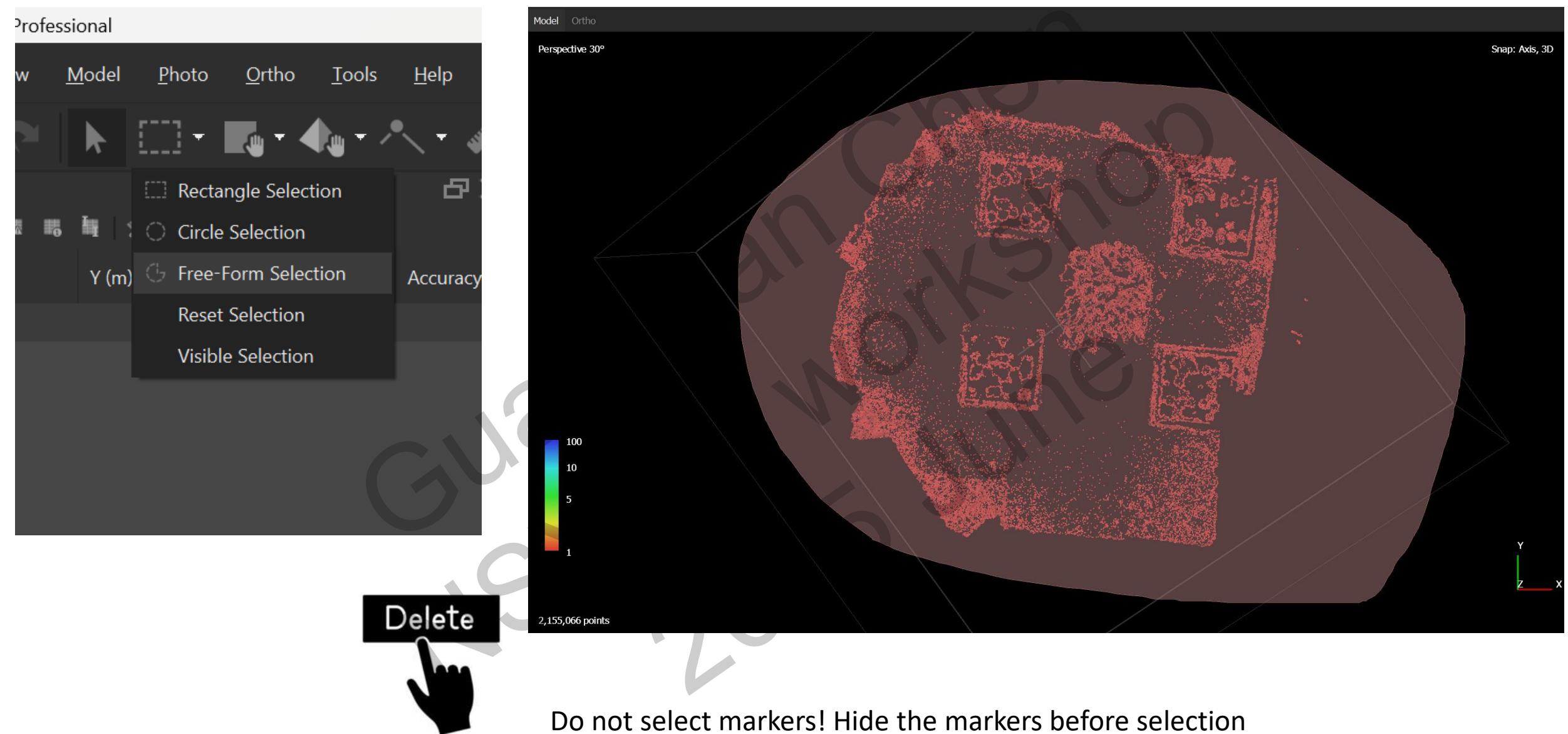


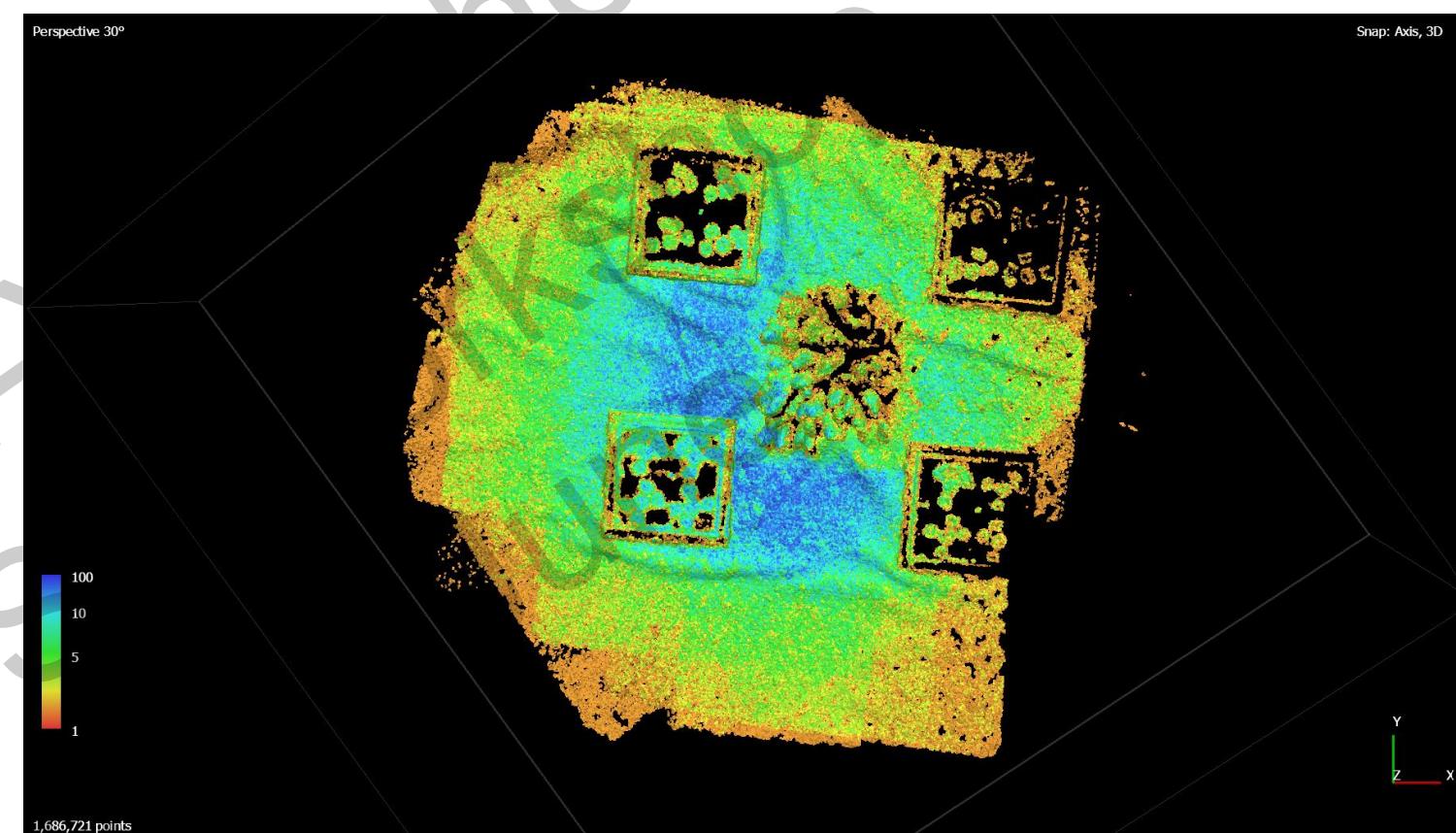
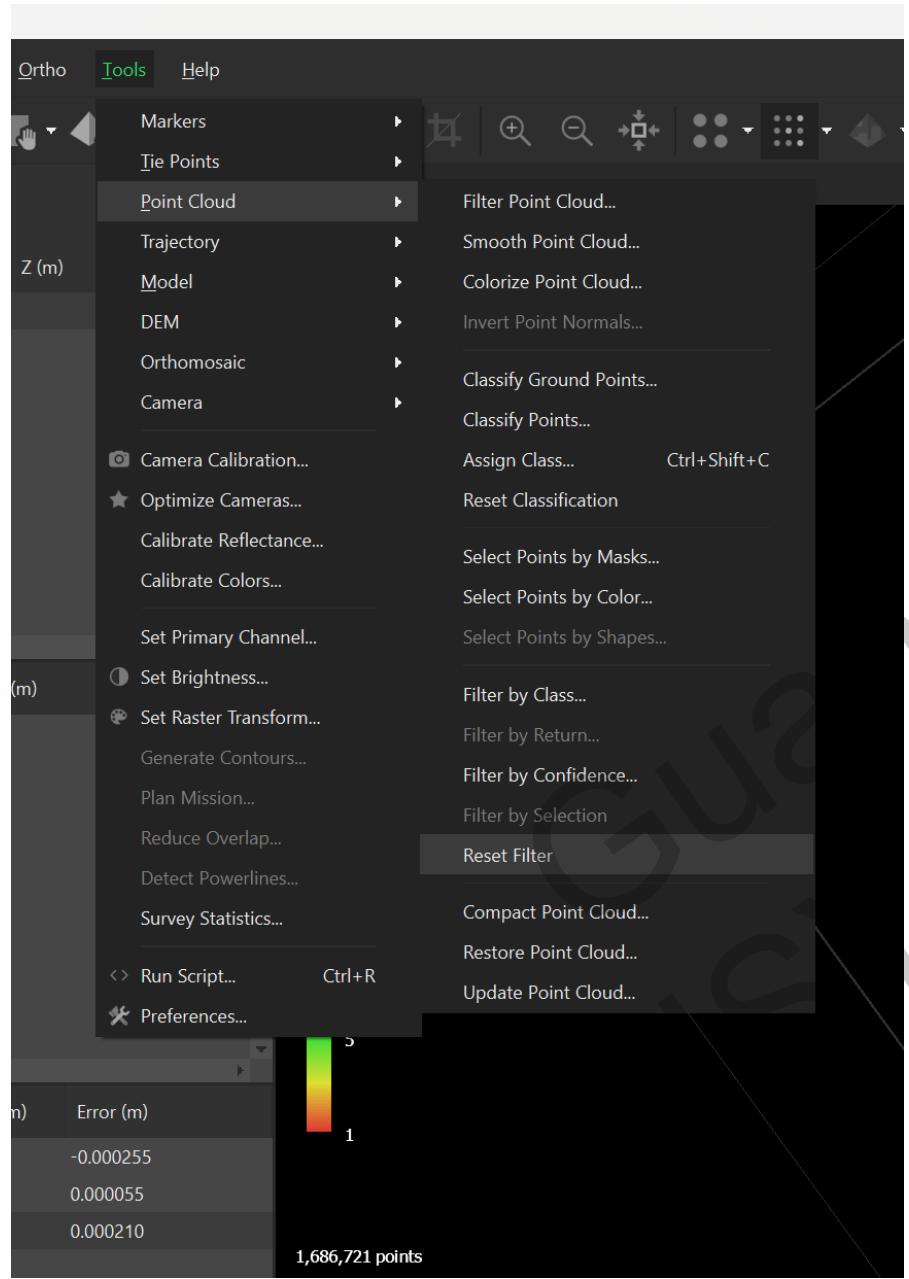


After Build Mesh can export  
depth map

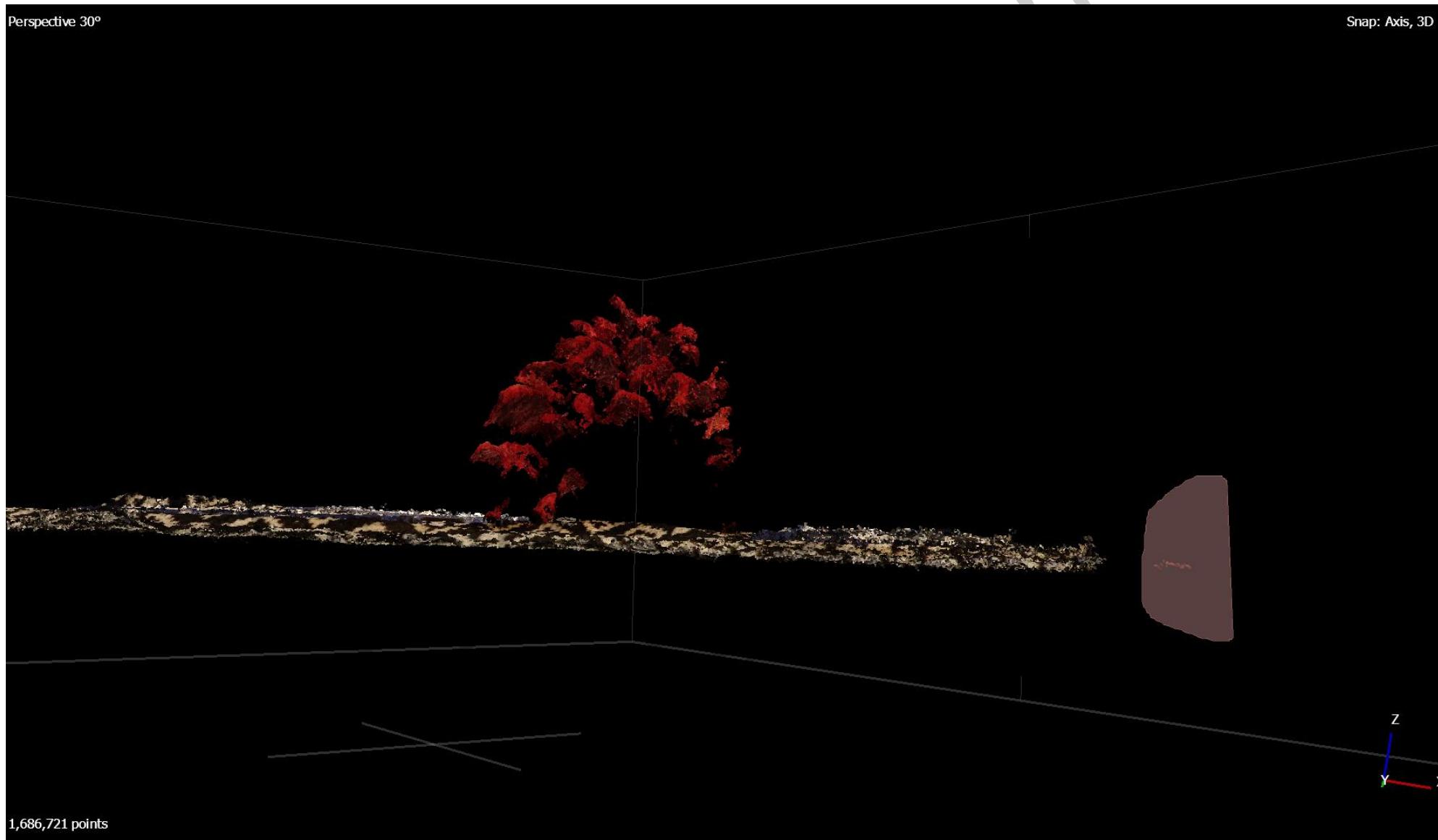




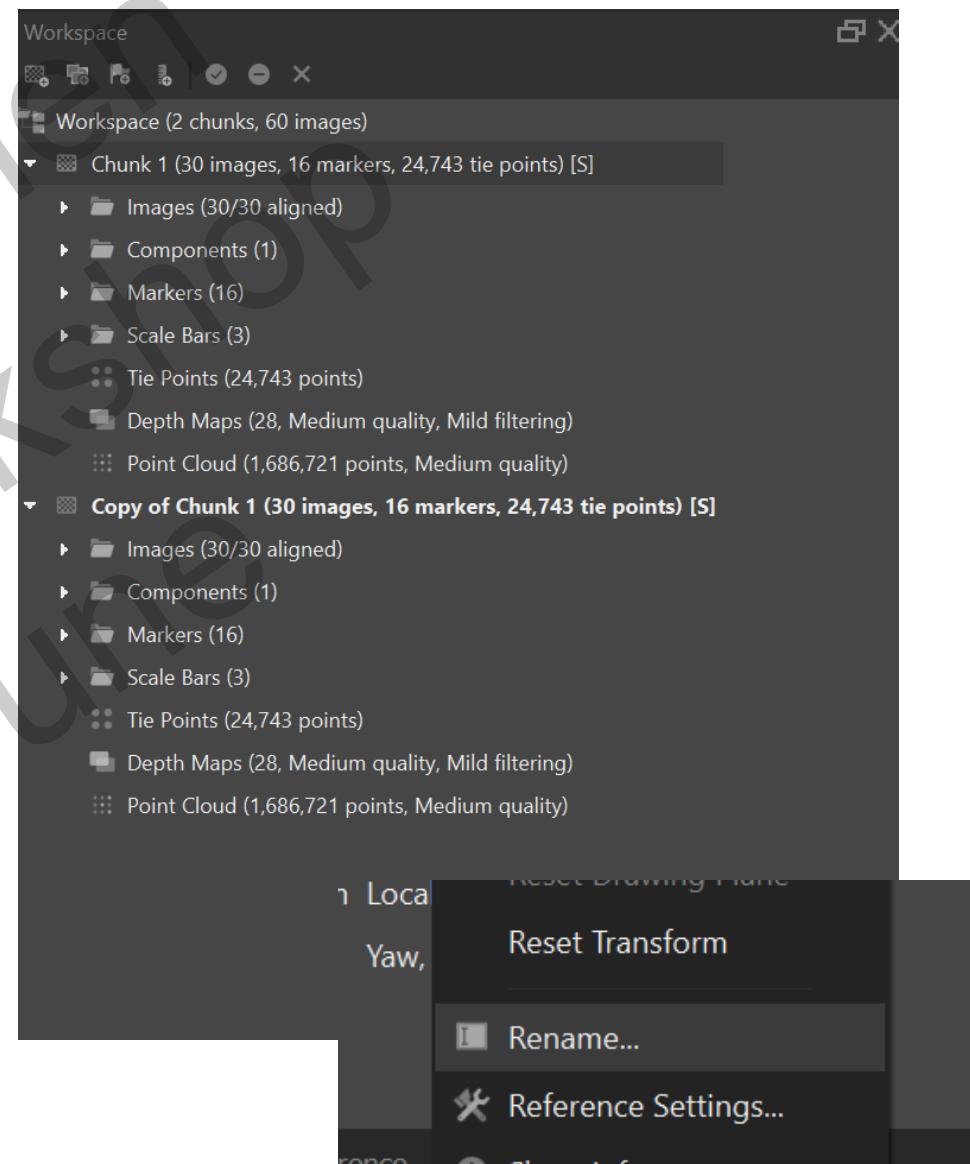
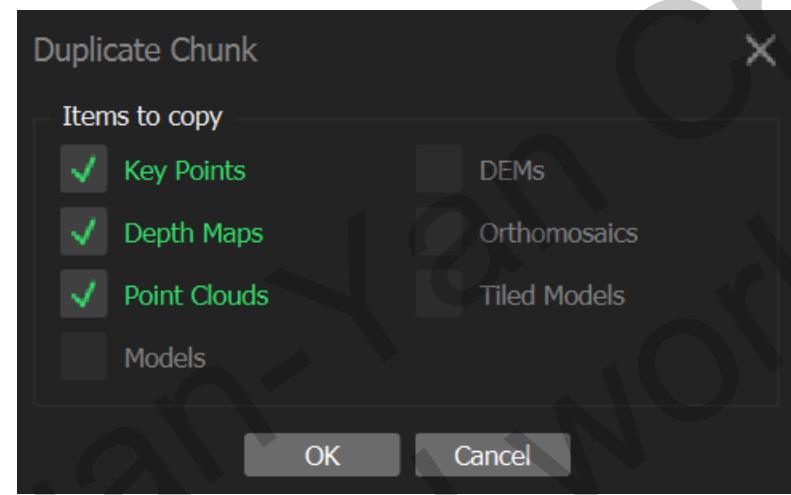
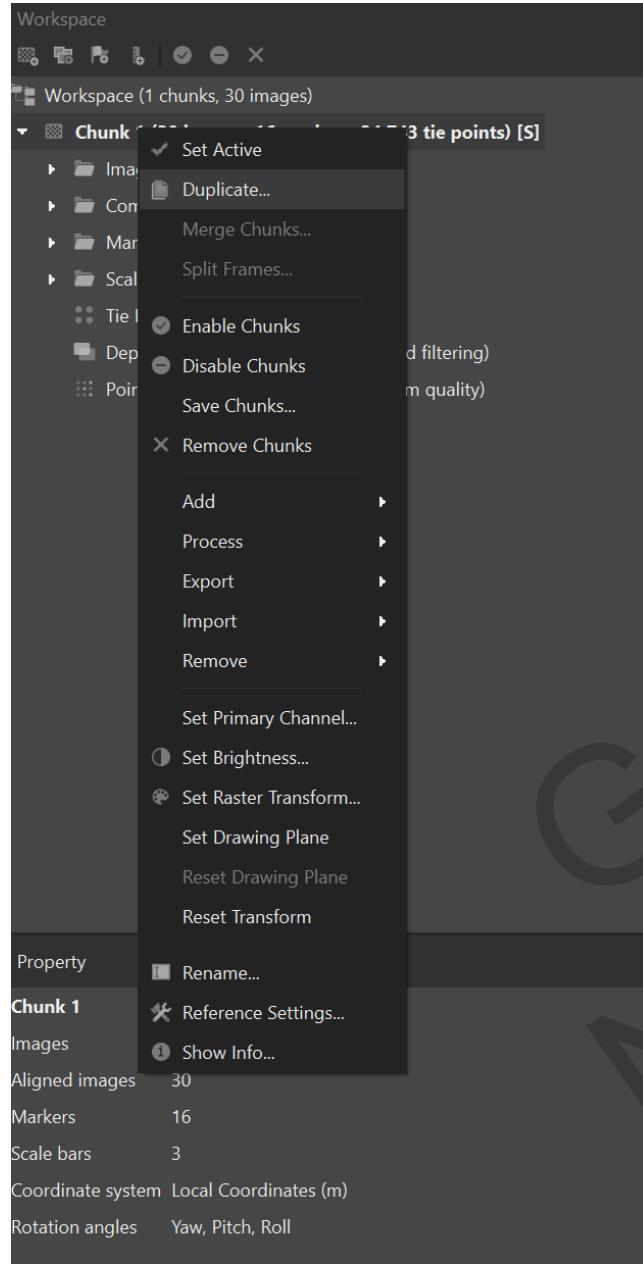




## Clean the outliers

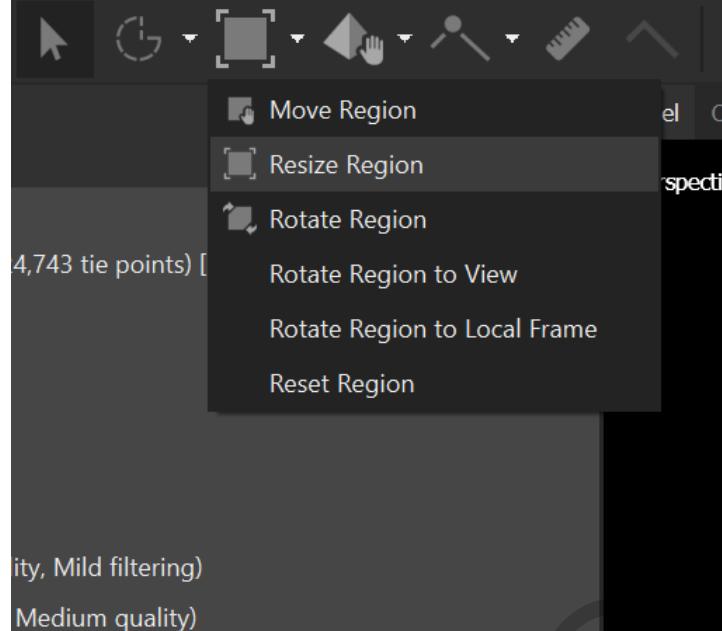


Guan-Yan Chen  
NSYSU Workshop  
2025 June  
NOAA SOP 2/3 completed



sional

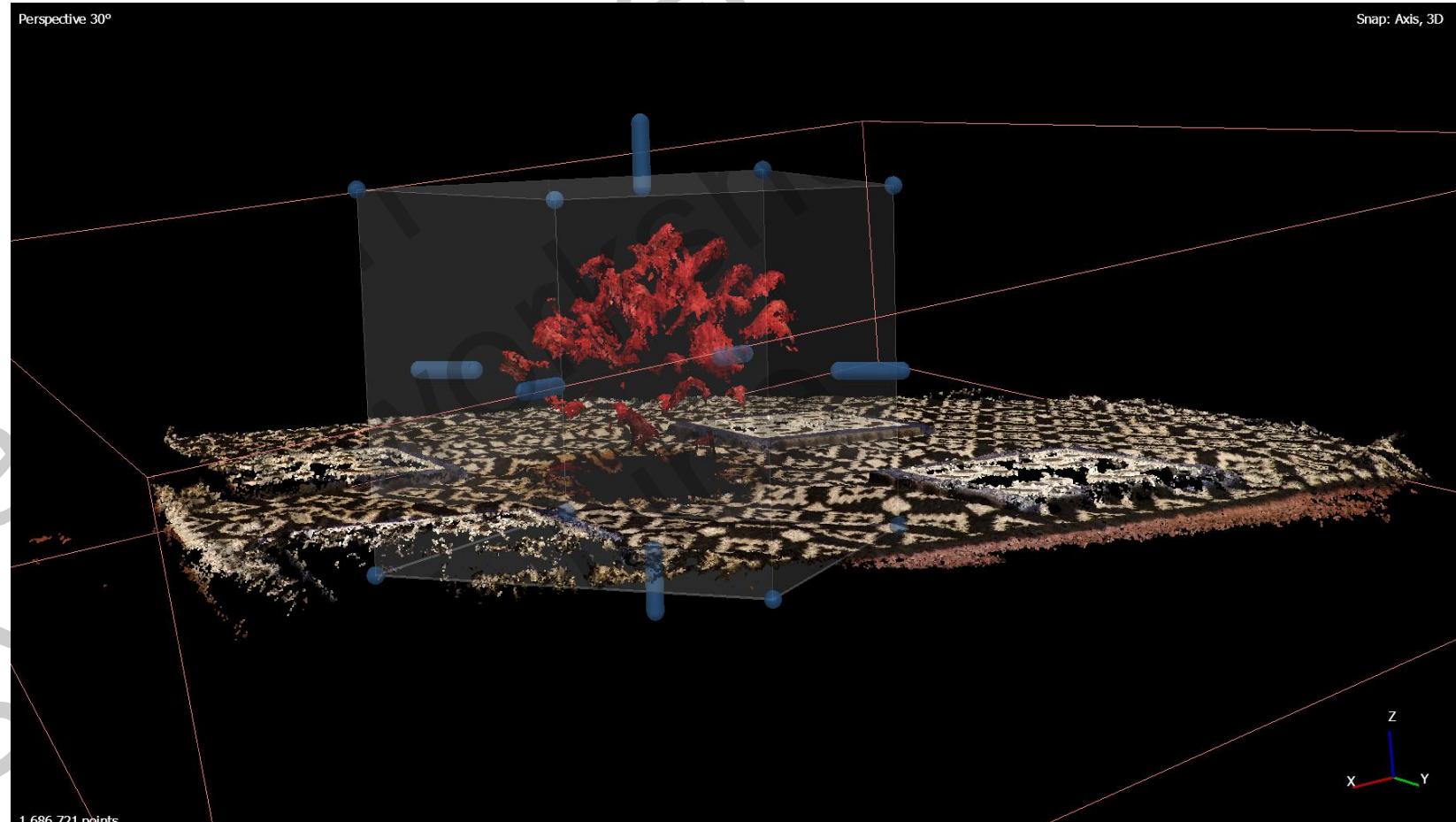
Model Photo Ortho Tools Help



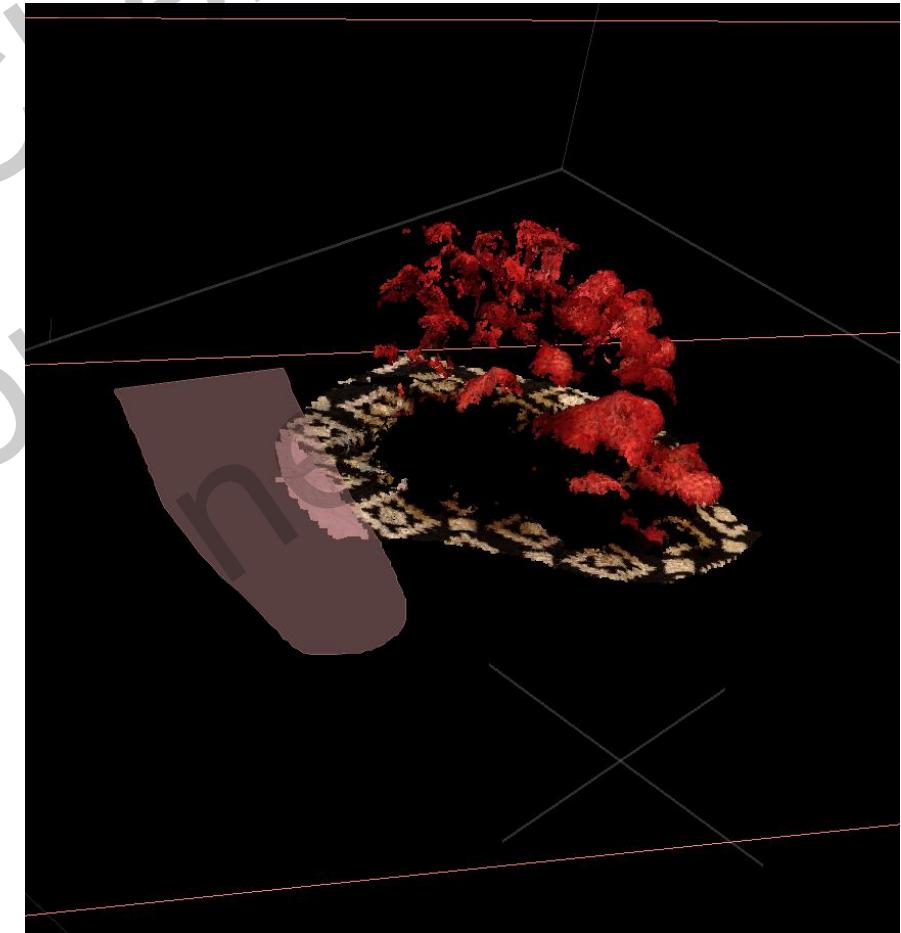
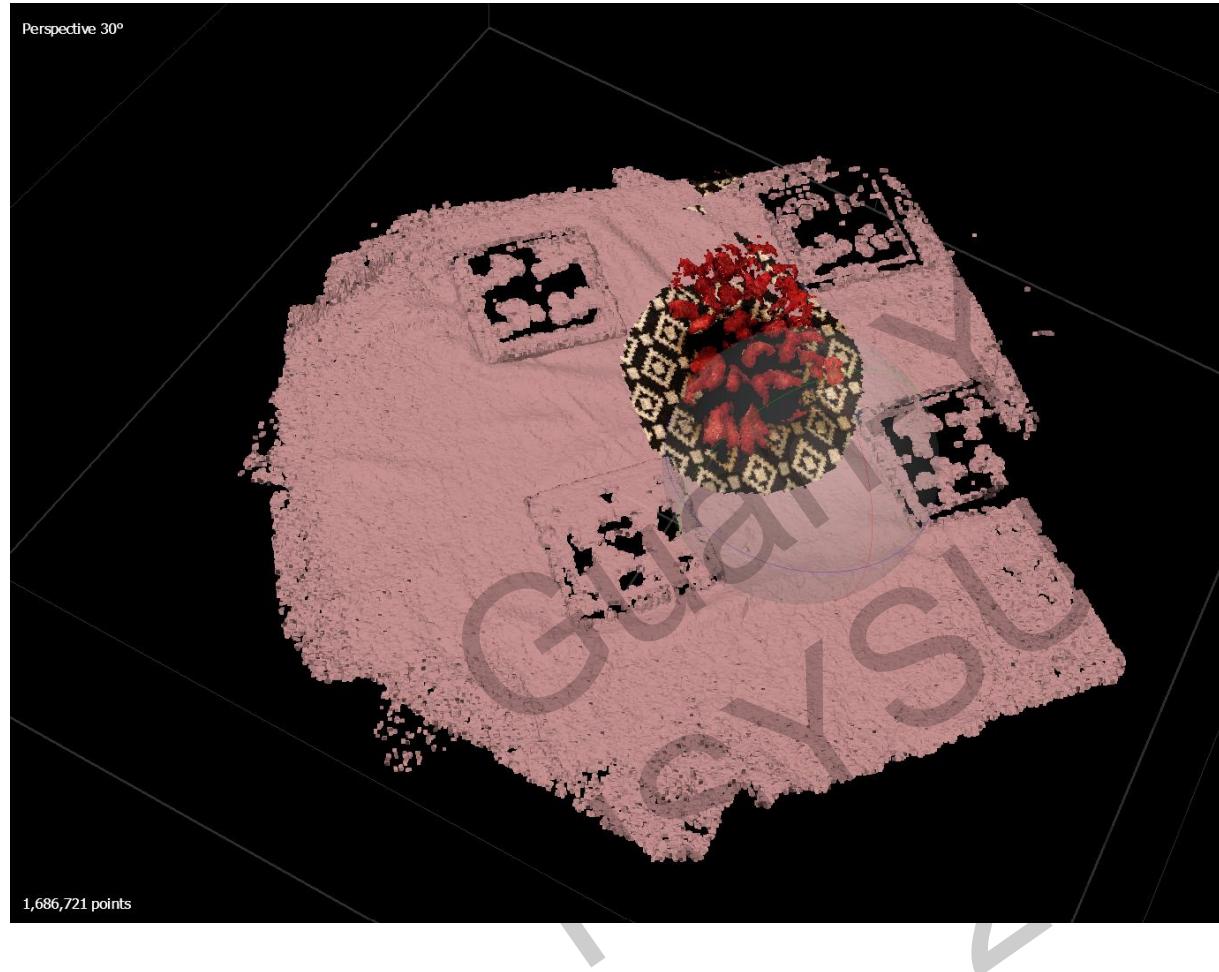
4,743 tie points [

ity, Mild filtering)

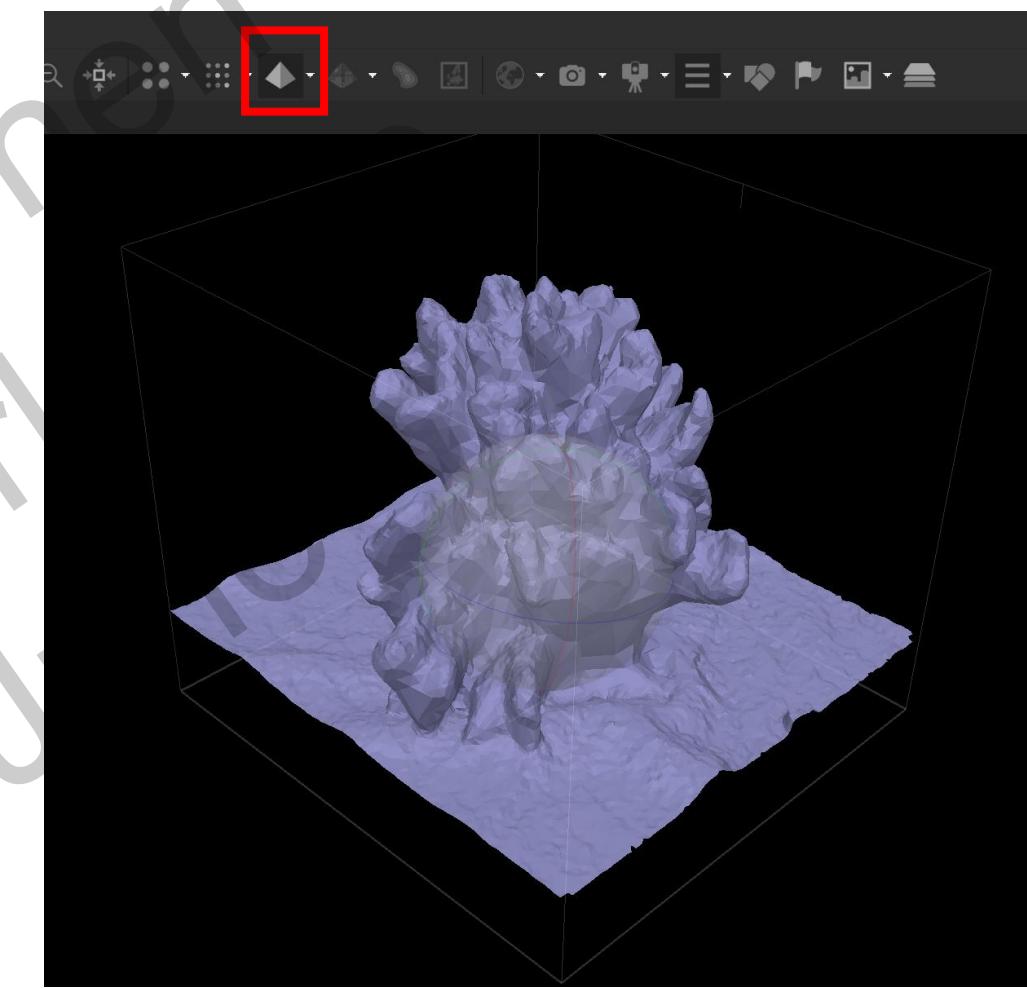
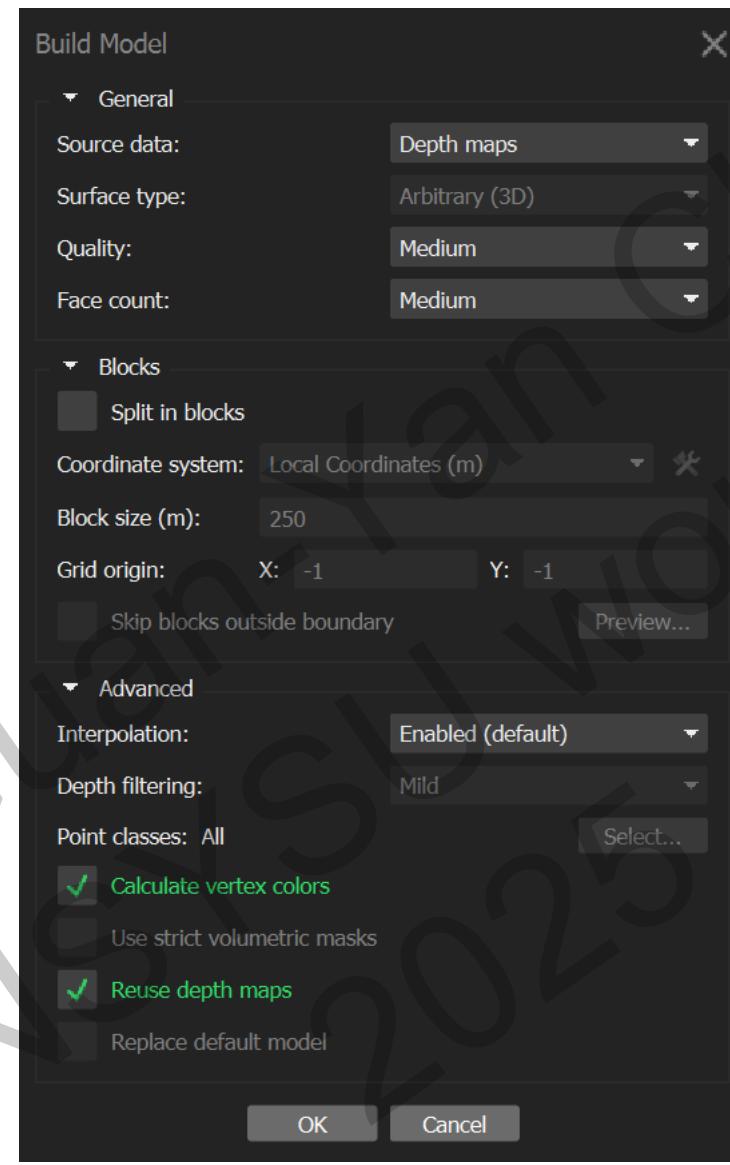
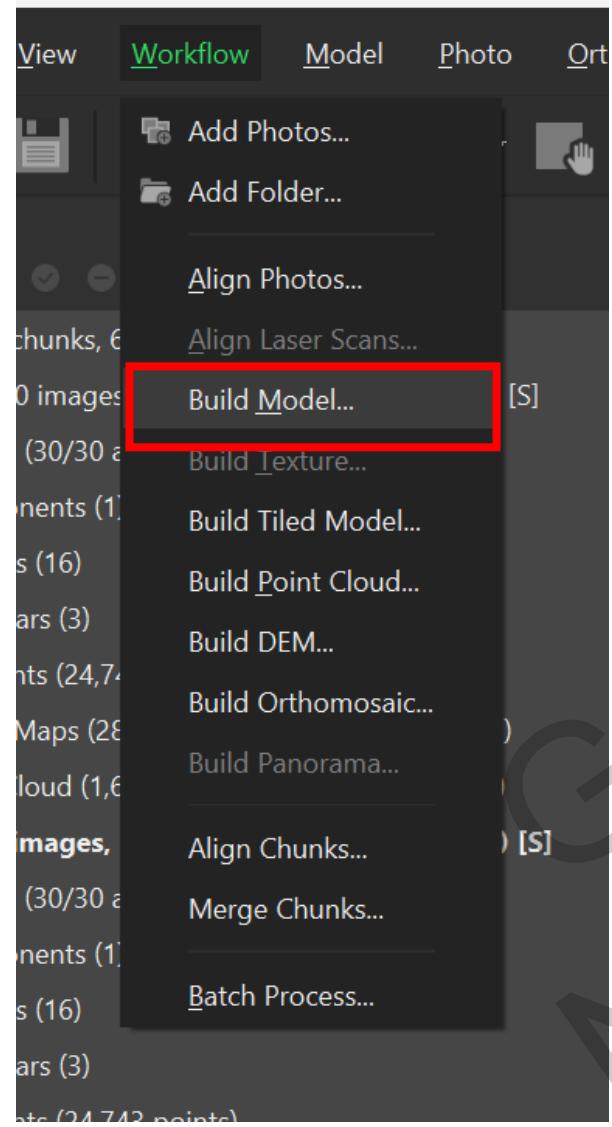
Medium quality)



Plan B: Clean the surrounding points, only keep the object



# isoft Metashape Professional



# Agisoft Metashape Professional

View Workflow Model Photo Ortho

Add Photos...  
Add Folder...

Align Photos...

(2 chunks, 6  
1 (30 images  
ges (30/30 a  
ponents (1)  
kers (16)

Build Model... [S]  
Build Texture...

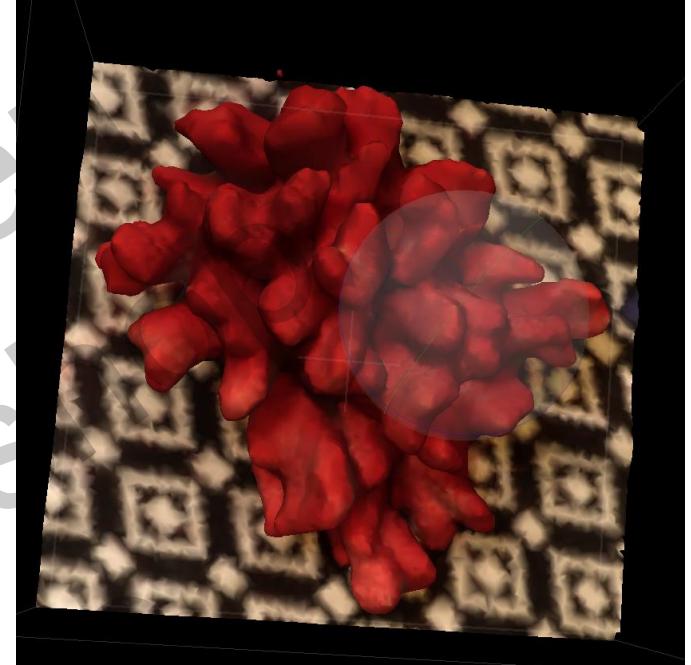
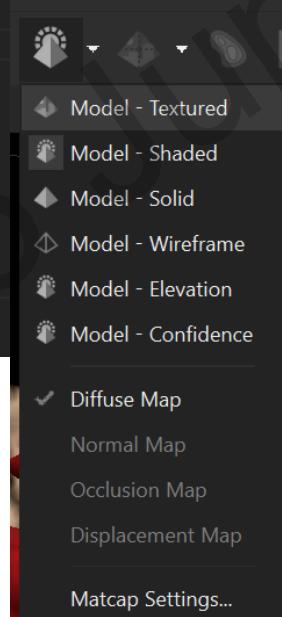
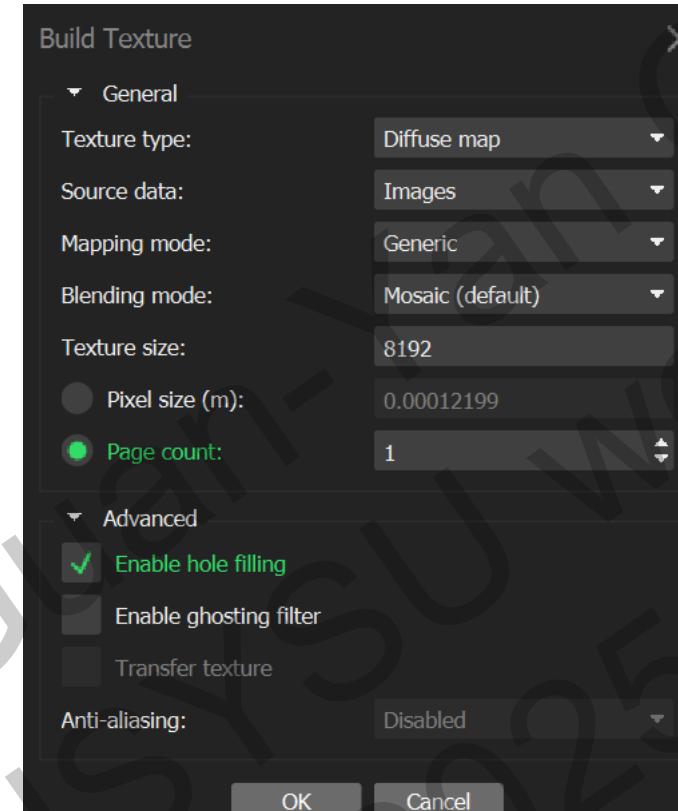
Build Tiled Model...  
Build Point Cloud...

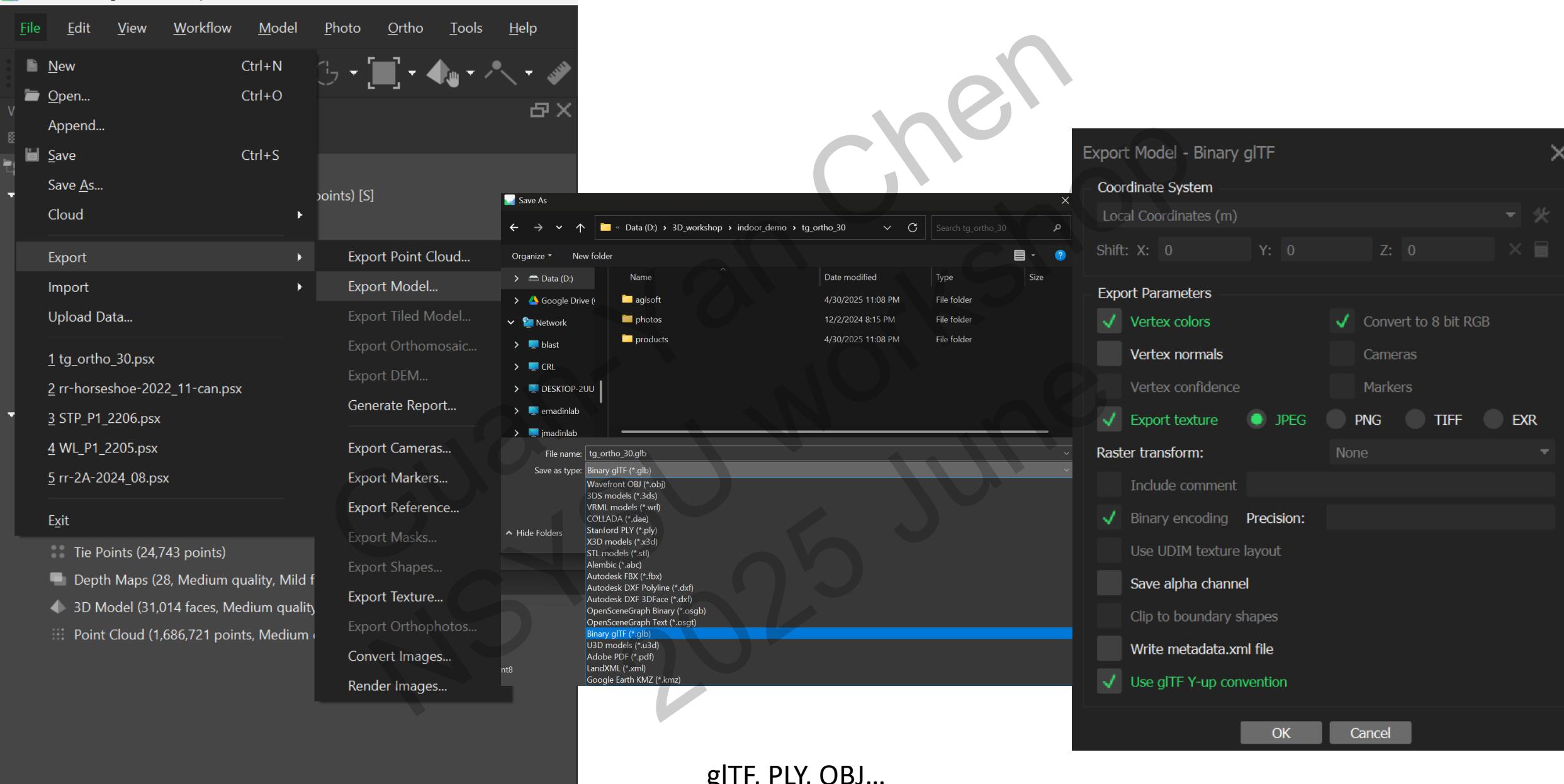
Build DEM...  
Build Orthomosaic...

Build Panorama...  
Align Chunks...

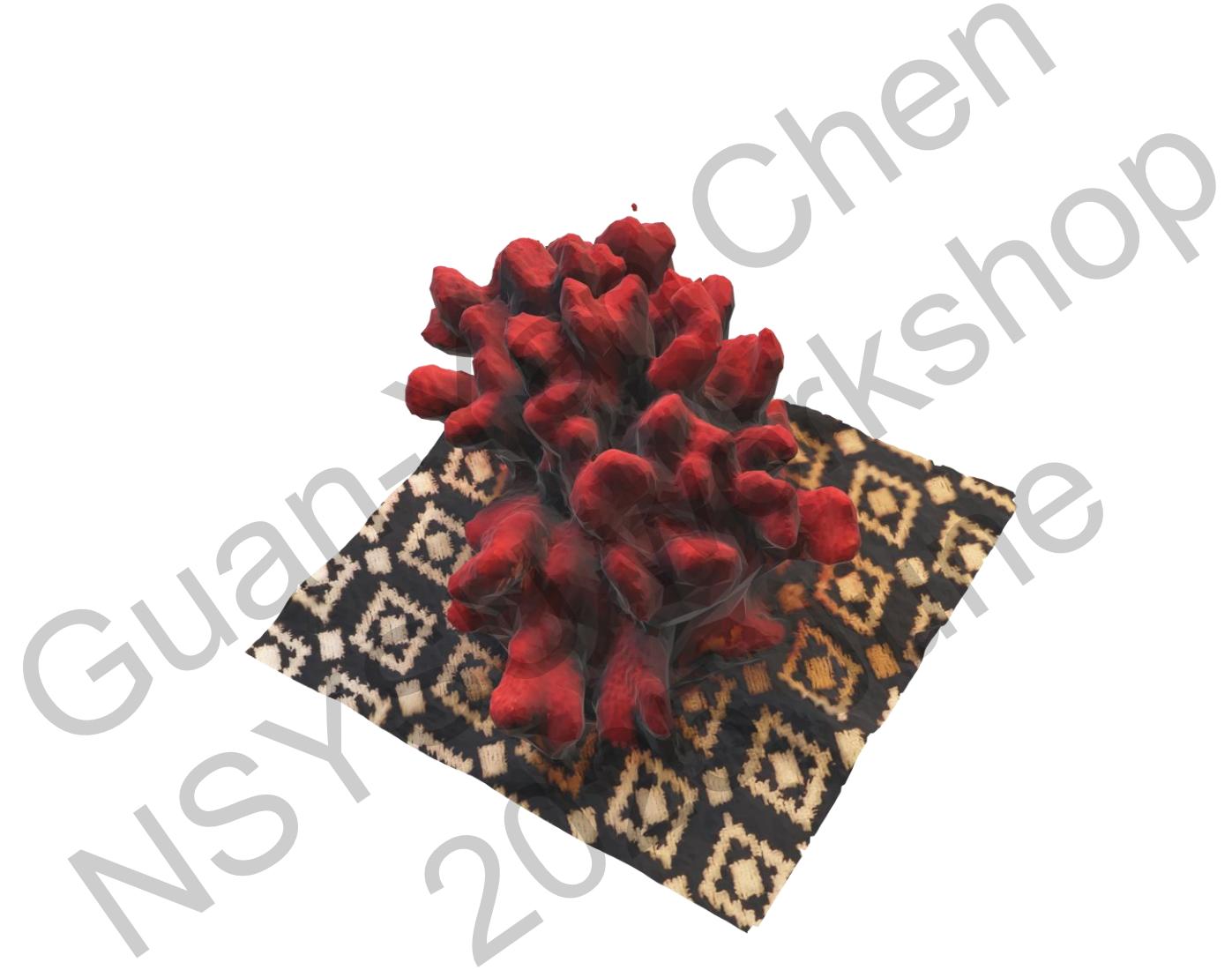
Merge Chunks...  
Batch Process...

3 tie points) [D]  
Points (24,743 points)  
Ortho Maps (28, Medium quality, Mild filtering)





gITF, PLY, OBJ...





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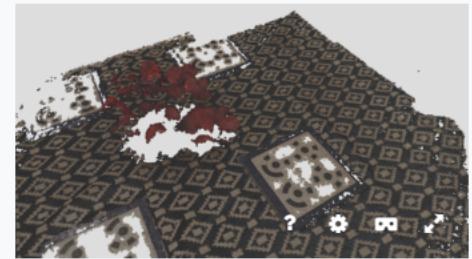
## Drag & Drop or browse

We support **FBX, OBJ, DAE, BLEND, STL**, and many others.

You can also upload an archive like **ZIP, RAR, or 7z**, containing your textures, materials, and mesh.  
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## Edit model



UPLOAD  
PROCESSED  
READY TO PUBLISH

FINISHED

FINISHED

EDIT 3D SETTINGS

DUPLICATE (PRO)

REUPLOAD

### Title

Tg\_ortho\_30\_ply

### Description

B I ⓟ H 66

A practice for NMMBA workshop

EDIT PREVIEW

996

### Categories

Nature & Plants

### Tags

taiwan X coral X Add another

Suggested tags: noai, createdwithtai, biology, sponge, marinelife, keelung, iontu

### Discoverability

Write a good description, add categories and tags to help your model get discovered.

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Your model has been published

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Status: Draft

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ON

Allow texture inspection

ON

Age-restricted content

OFF

Promotional content

OFF

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Store

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Max size: 2GB

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<https://skfb.ly/pwDuL>

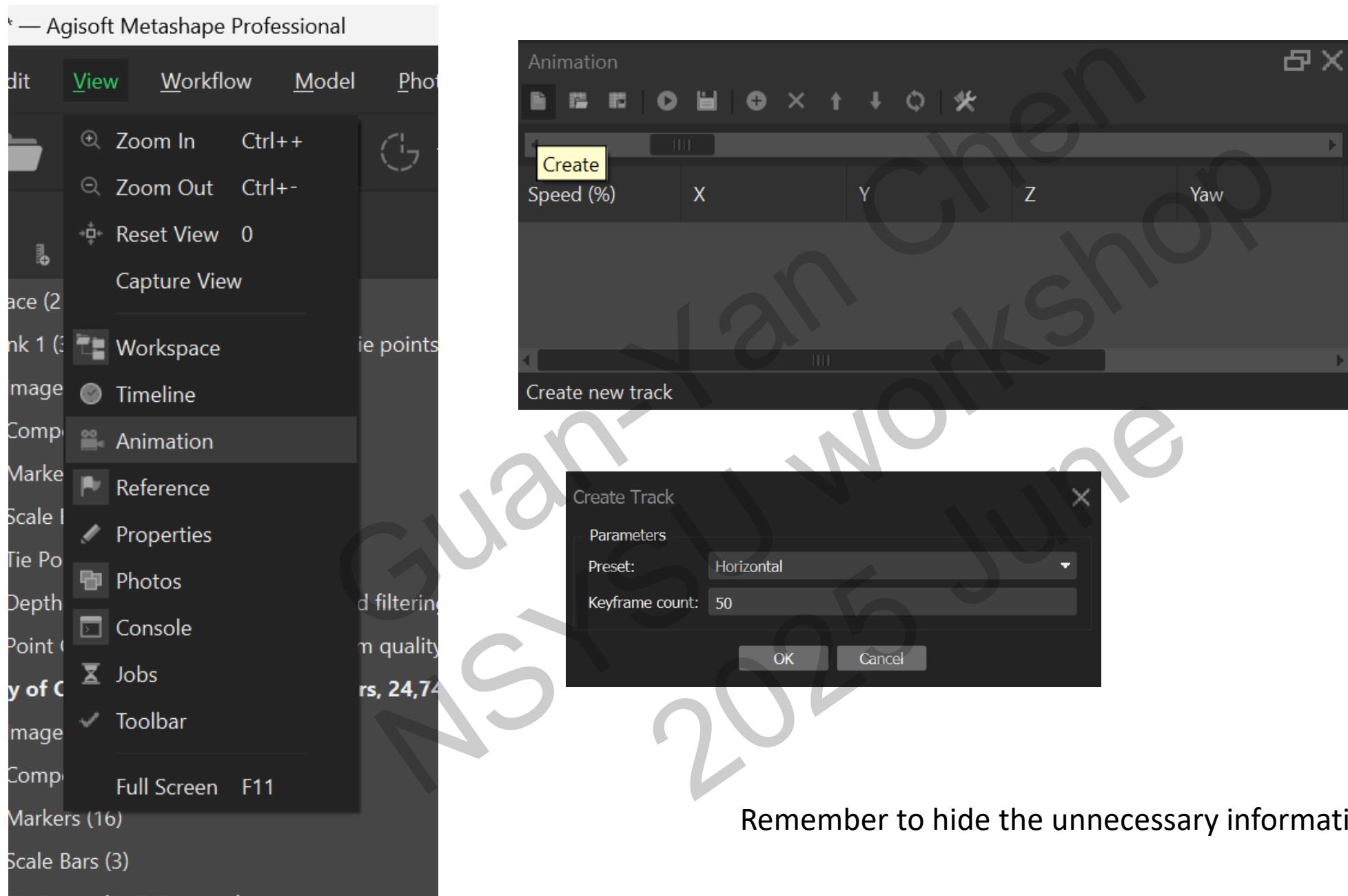
COPY



SAVE

SAVE & PUBLISH





Remember to hide the unnecessary information

