

國立中山大學
National Sun Yat-sen University



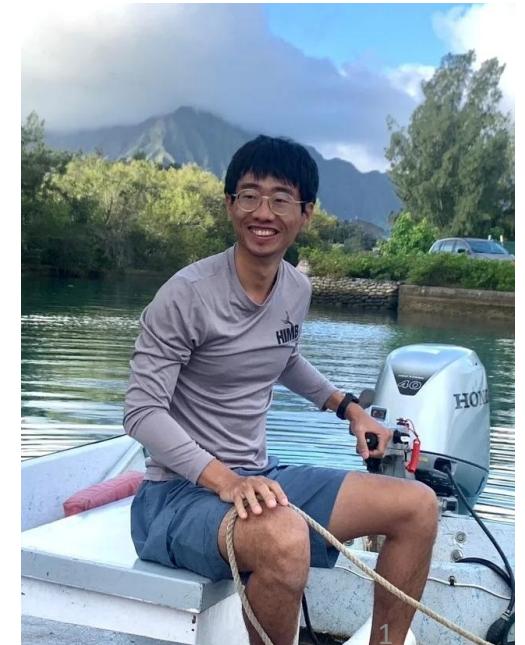
Metashape workflow

Guan-Yan Chen 陳冠言

Ph.D. candidate, Hawaii Institute of Marine Biology



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)

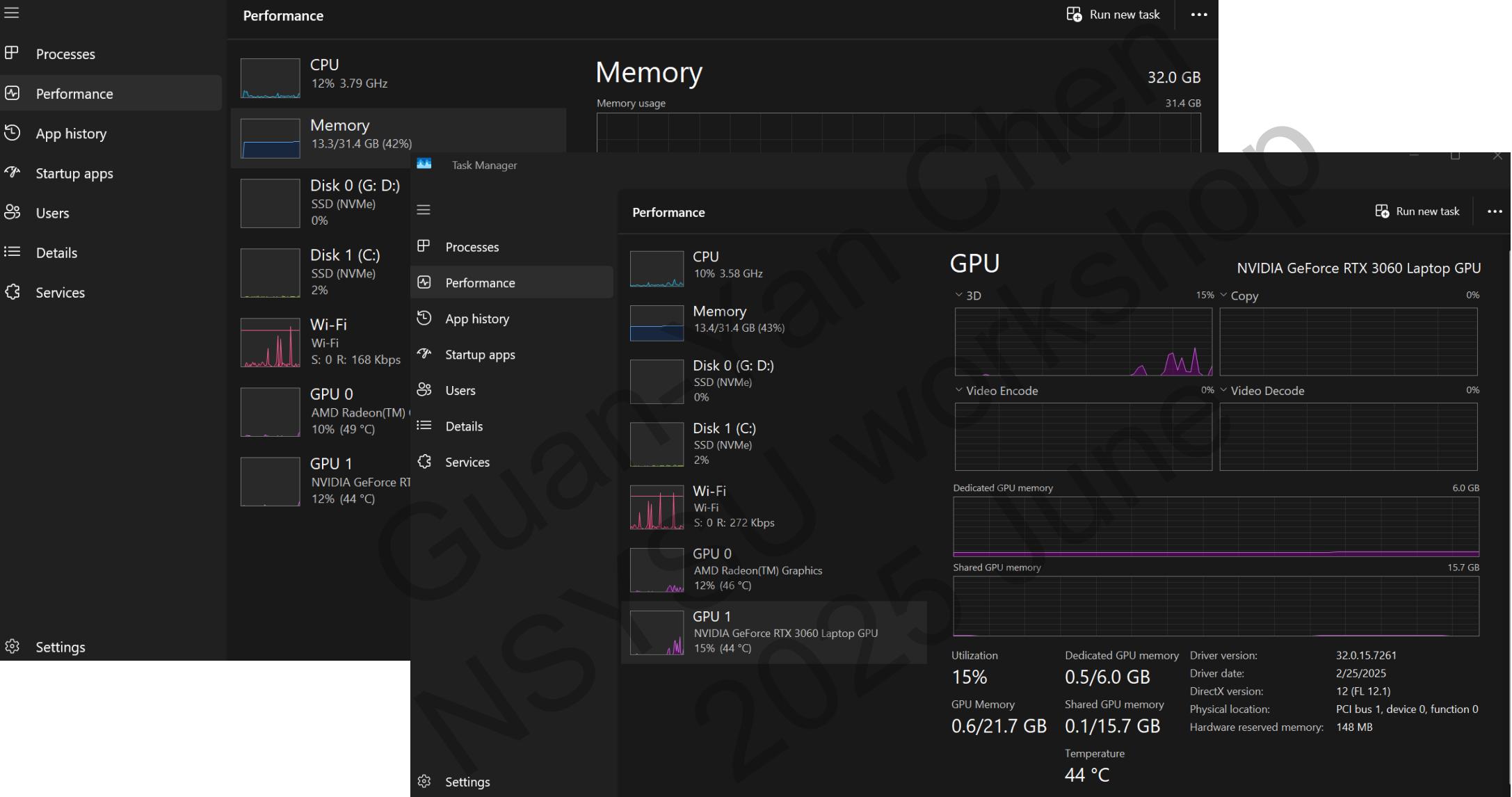
RAM: 32 - 128 GB

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



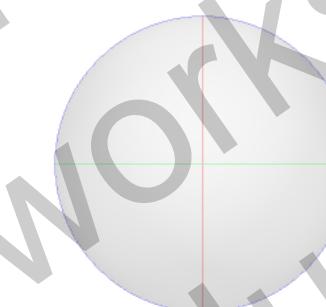
Workspace
Model Ortho
Perspective 30°
Workspace (1 chunks, 0 cameras)
Chunk 1 (0 cameras)

Snap: Axis, 3D

工作面板

視覺化面板

Traceball



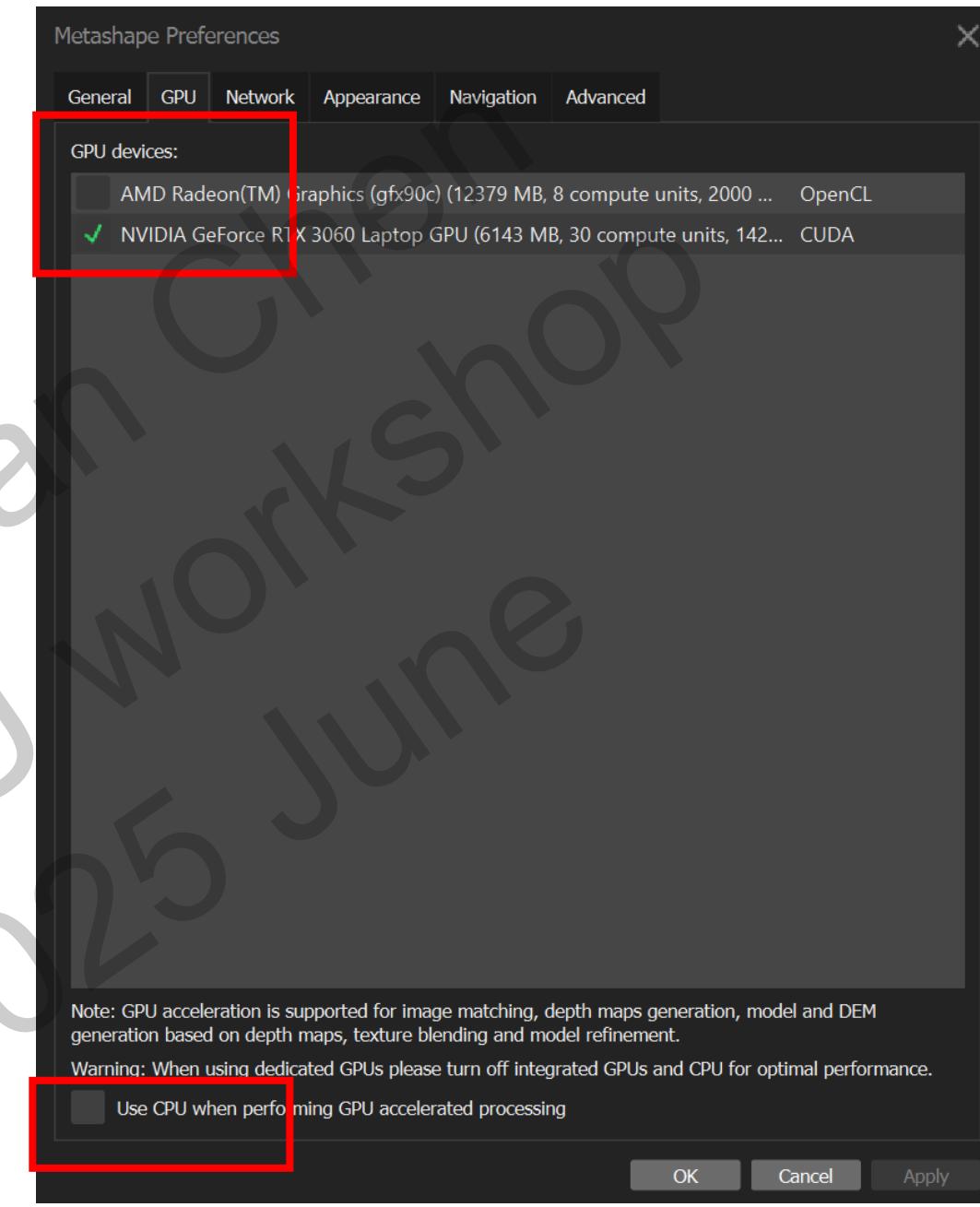
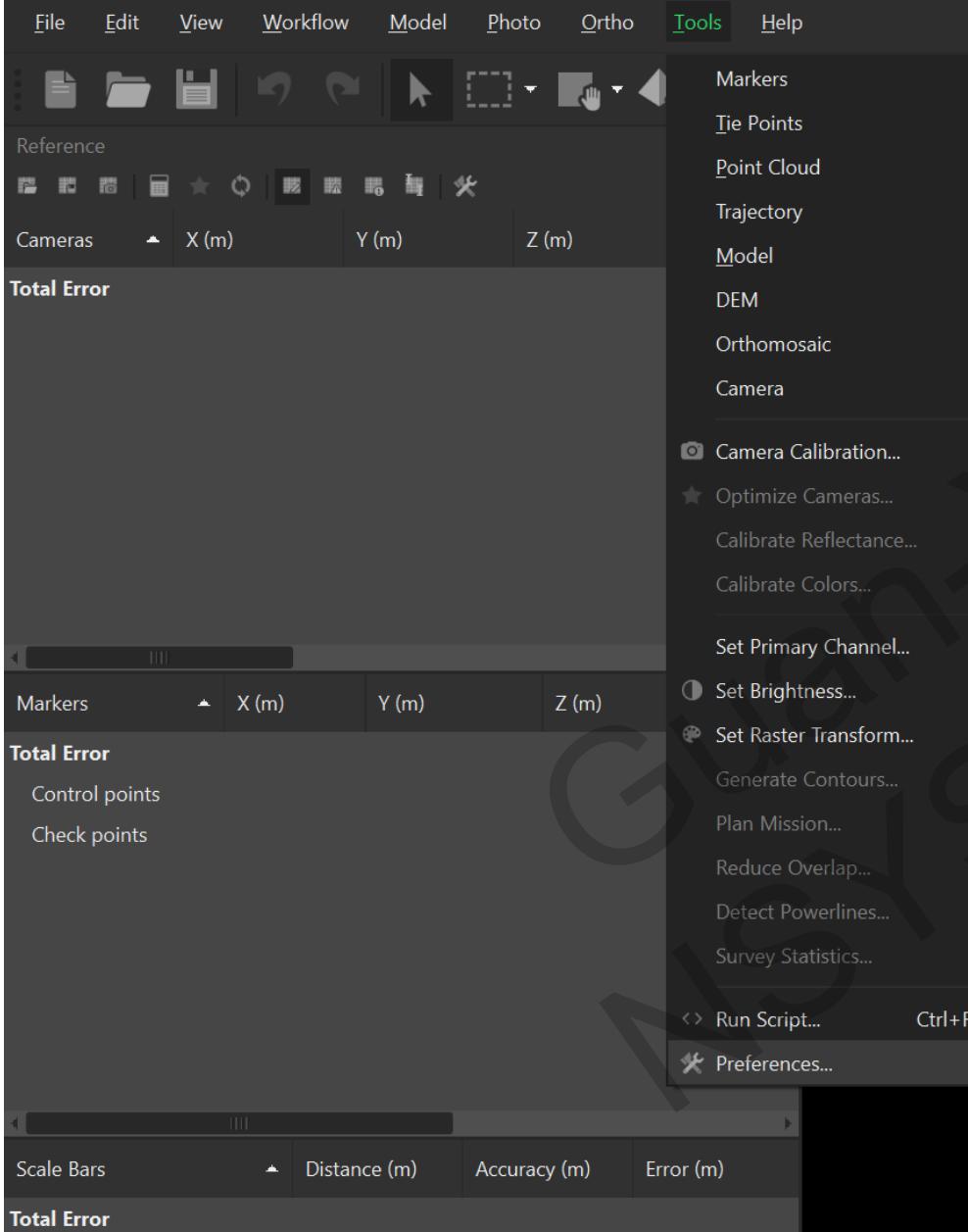
Y
Z
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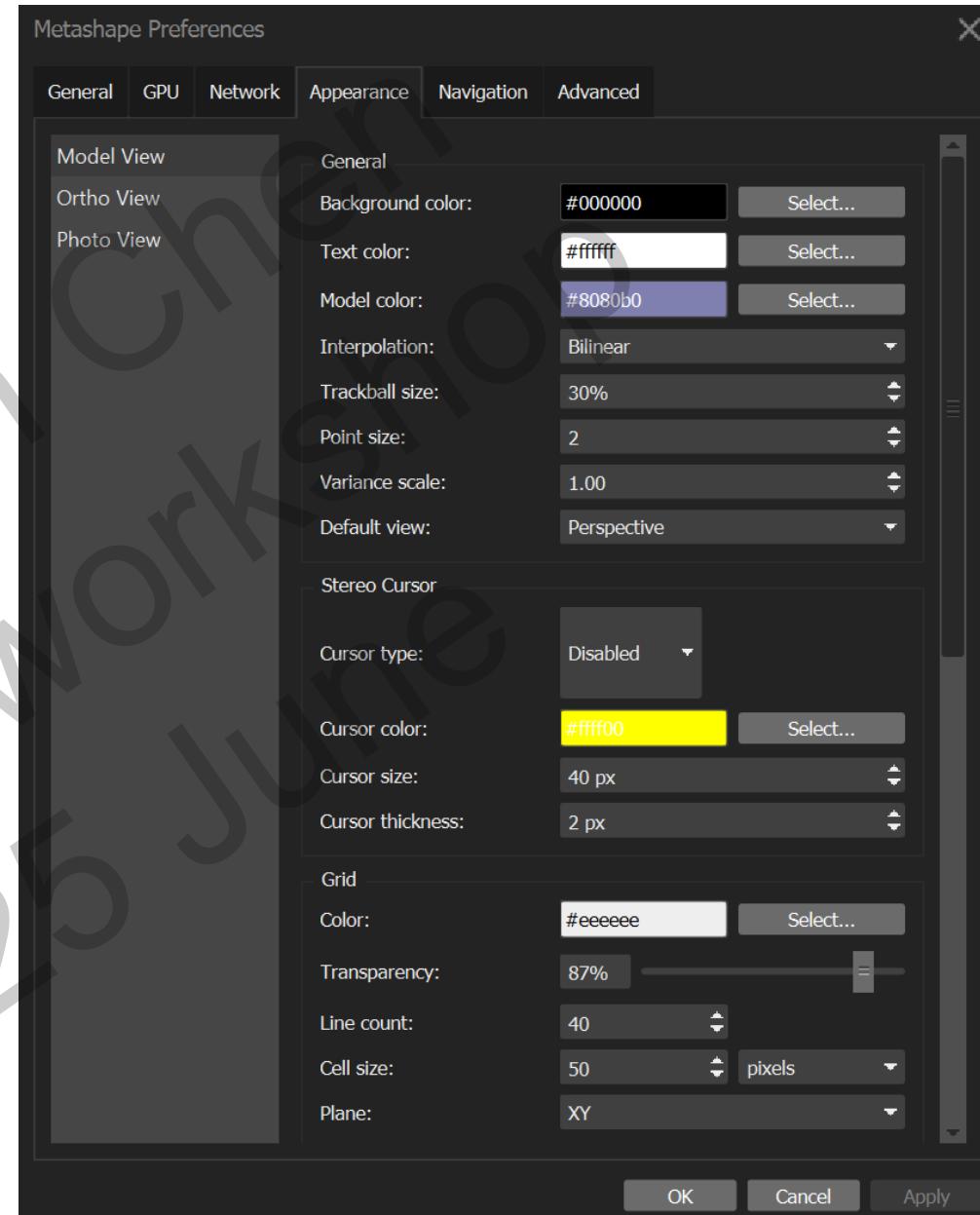
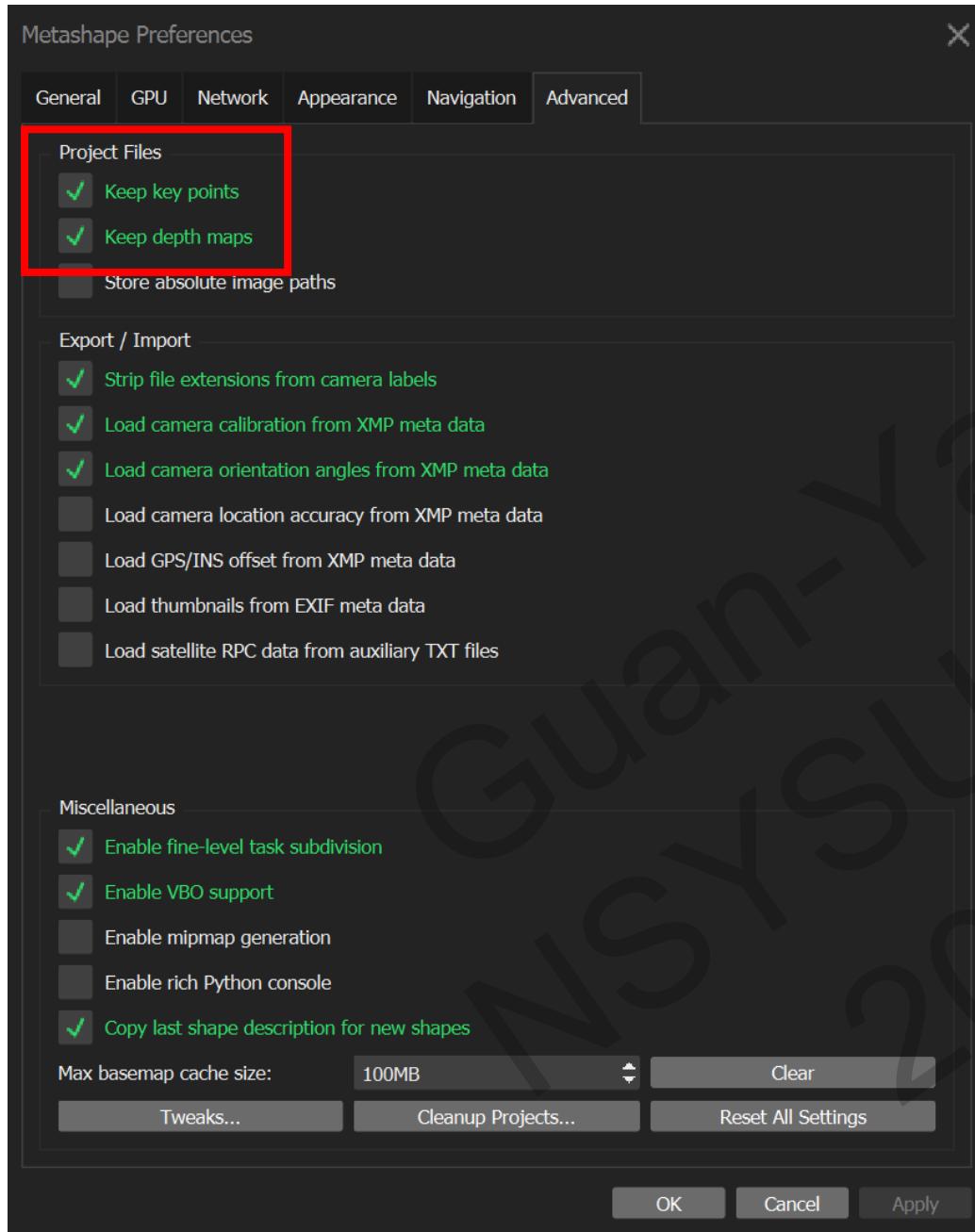
Photos	Label	Size	Aligned	Quality	Date & time	Make	Model	Focal length	Frame	ISO	Shutter	35mm focal	Sensor X res	Sensor Y res	Orientation (°)	Path	En

Workspace Reference

Photos Console Jobs

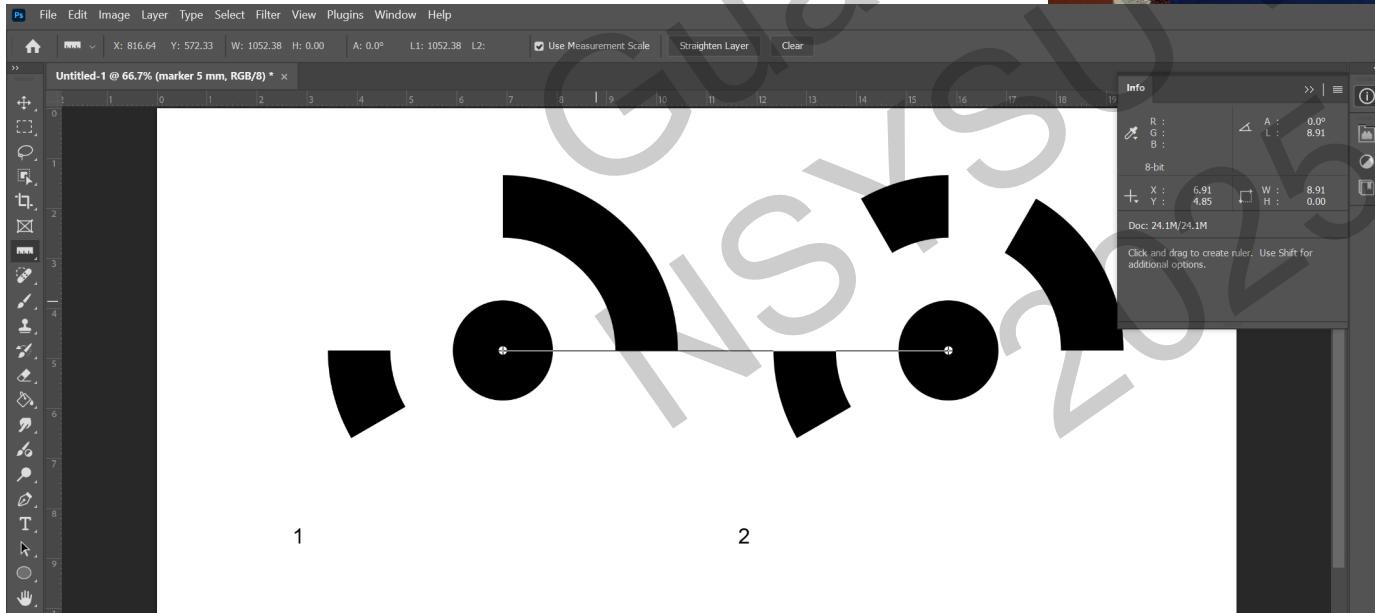
照片匯入區







Ps

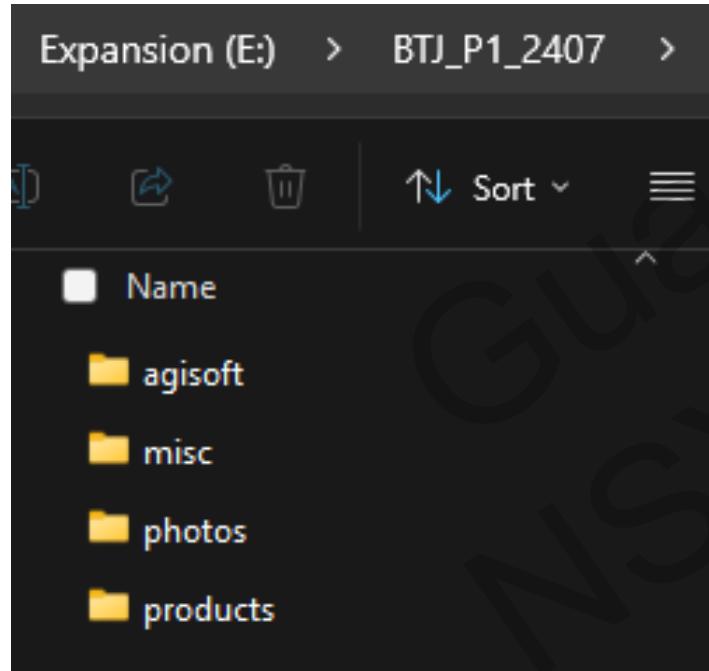


資料存放結構與命名

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

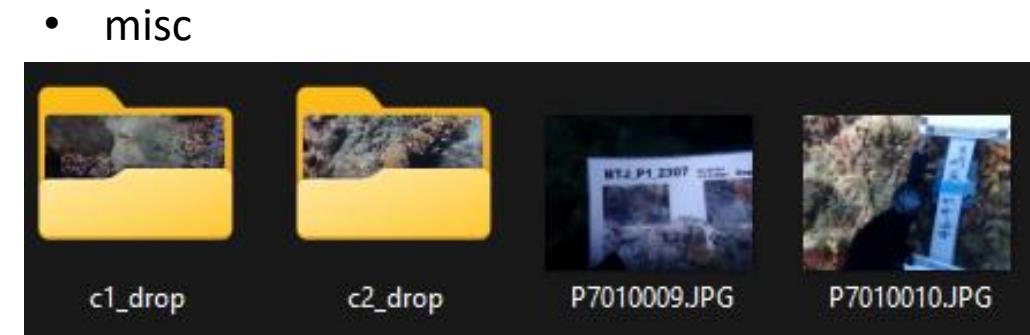
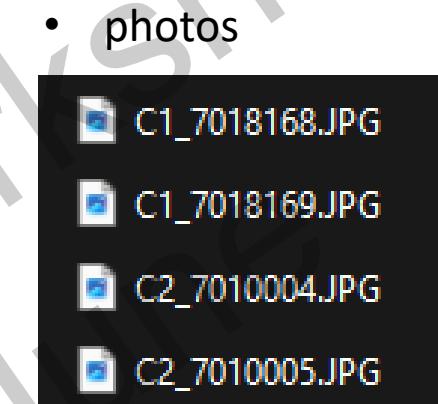
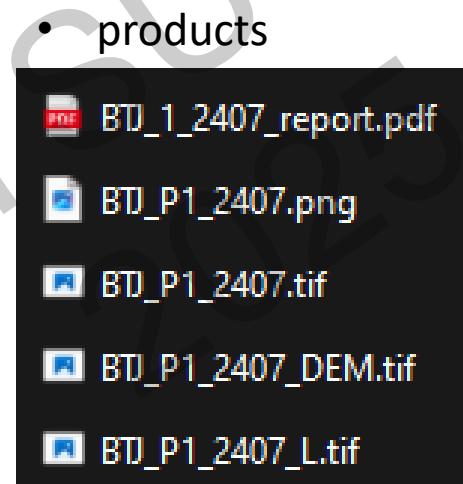
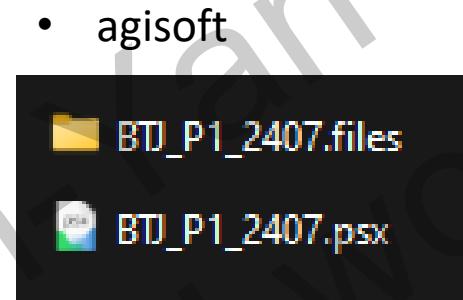
資料夾結構：

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

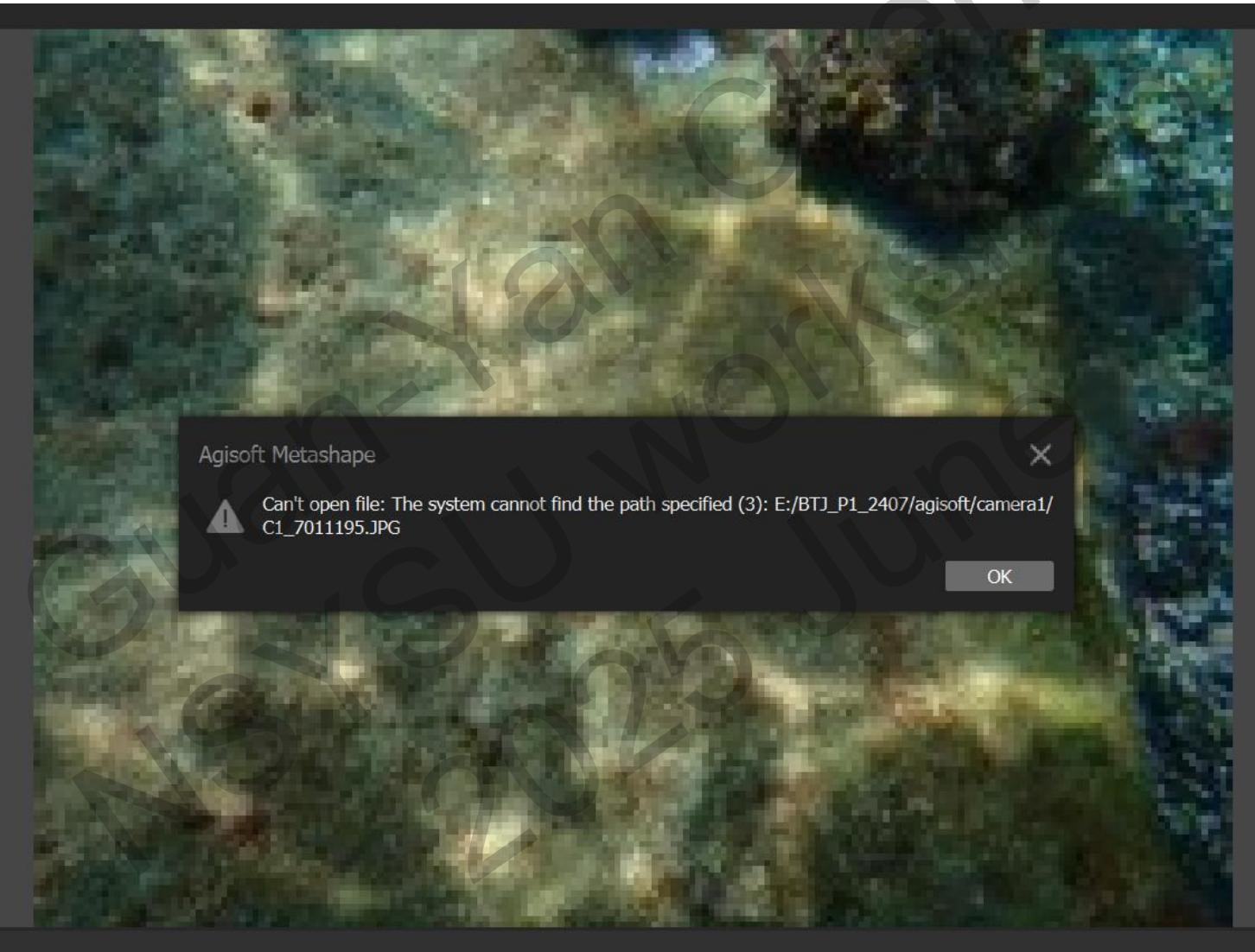


完善的資料管理



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)

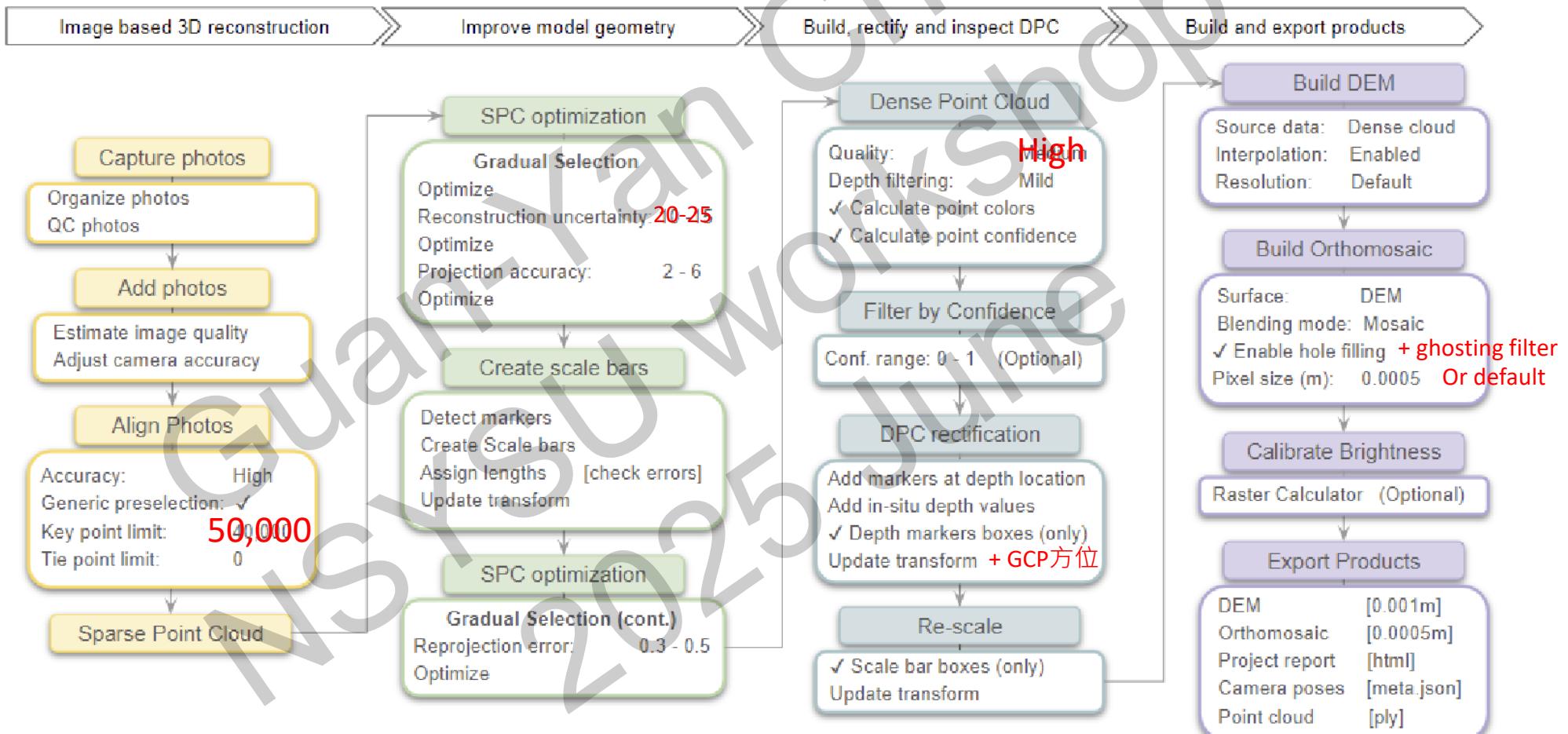
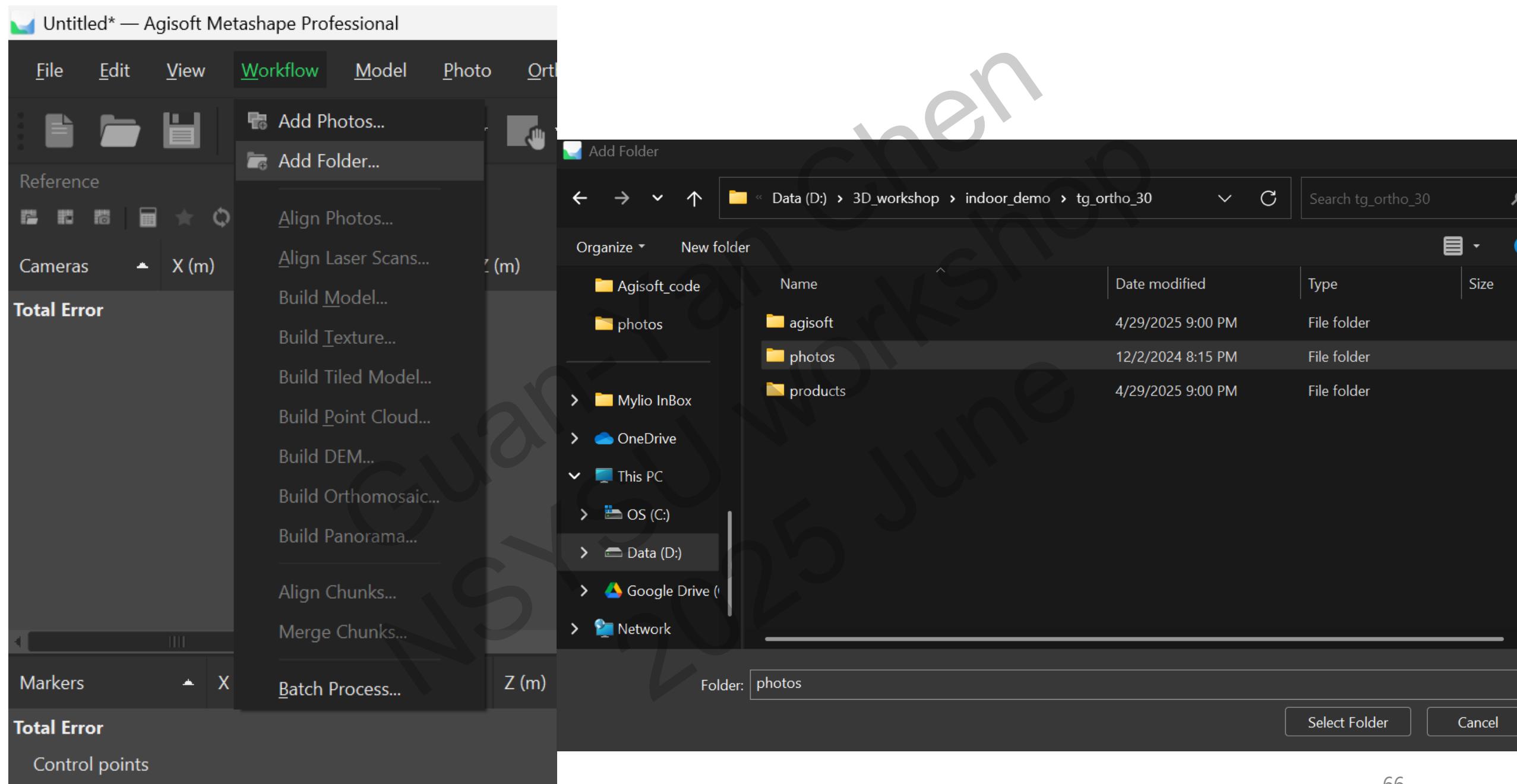


Figure 4.1 A schematic workflow of the image based 3D reconstruction and product generation of coral reef scenes through SfM photogrammetry in Agisoft Metashape.

(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
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- PC020154, NA
- PC020155, NA
- PC020156, NA
- PC020157, NA

Perspective 30°



Photos

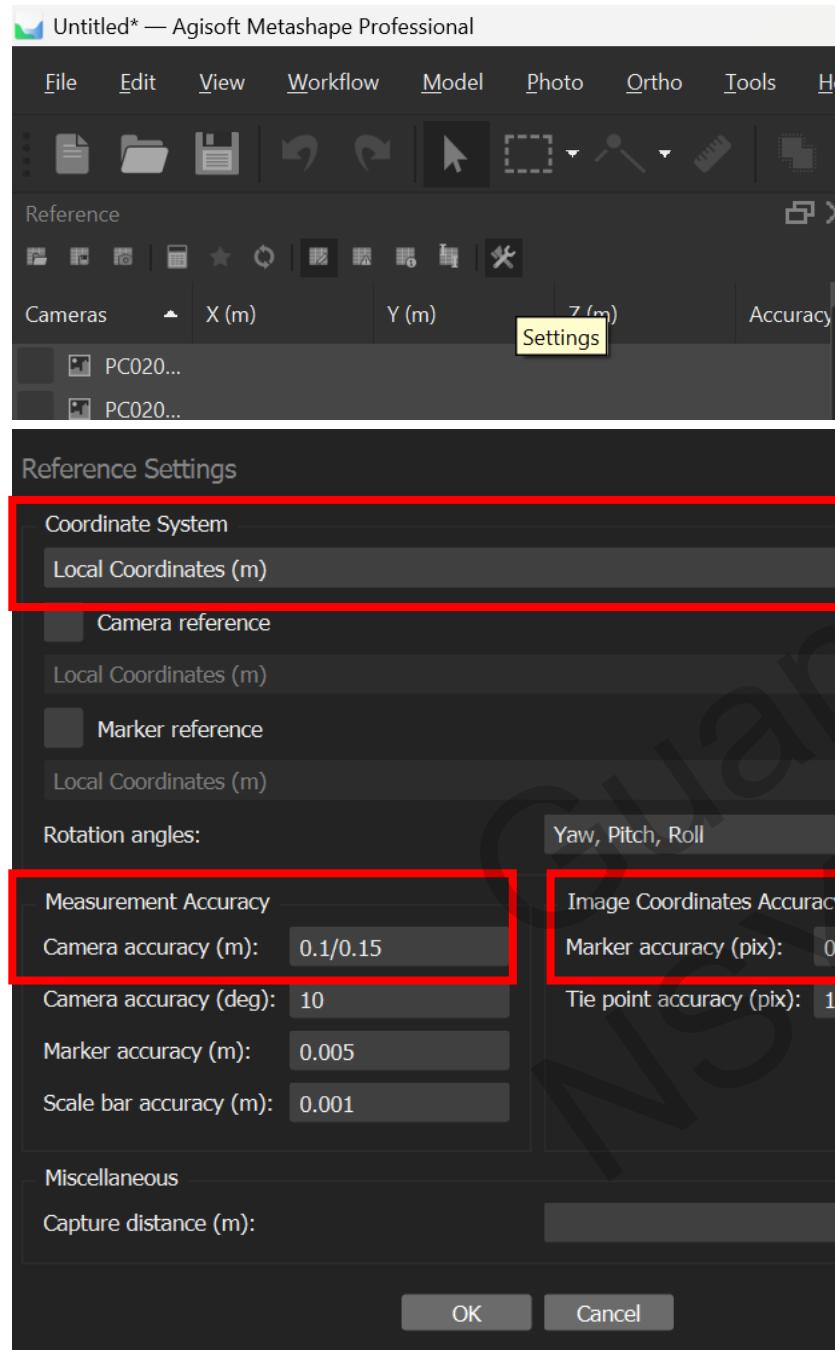


PC020138 PC020139 PC020140 PC020141 PC020142 PC020143 PC020144 PC020145 PC020146 PC020147 PC020148



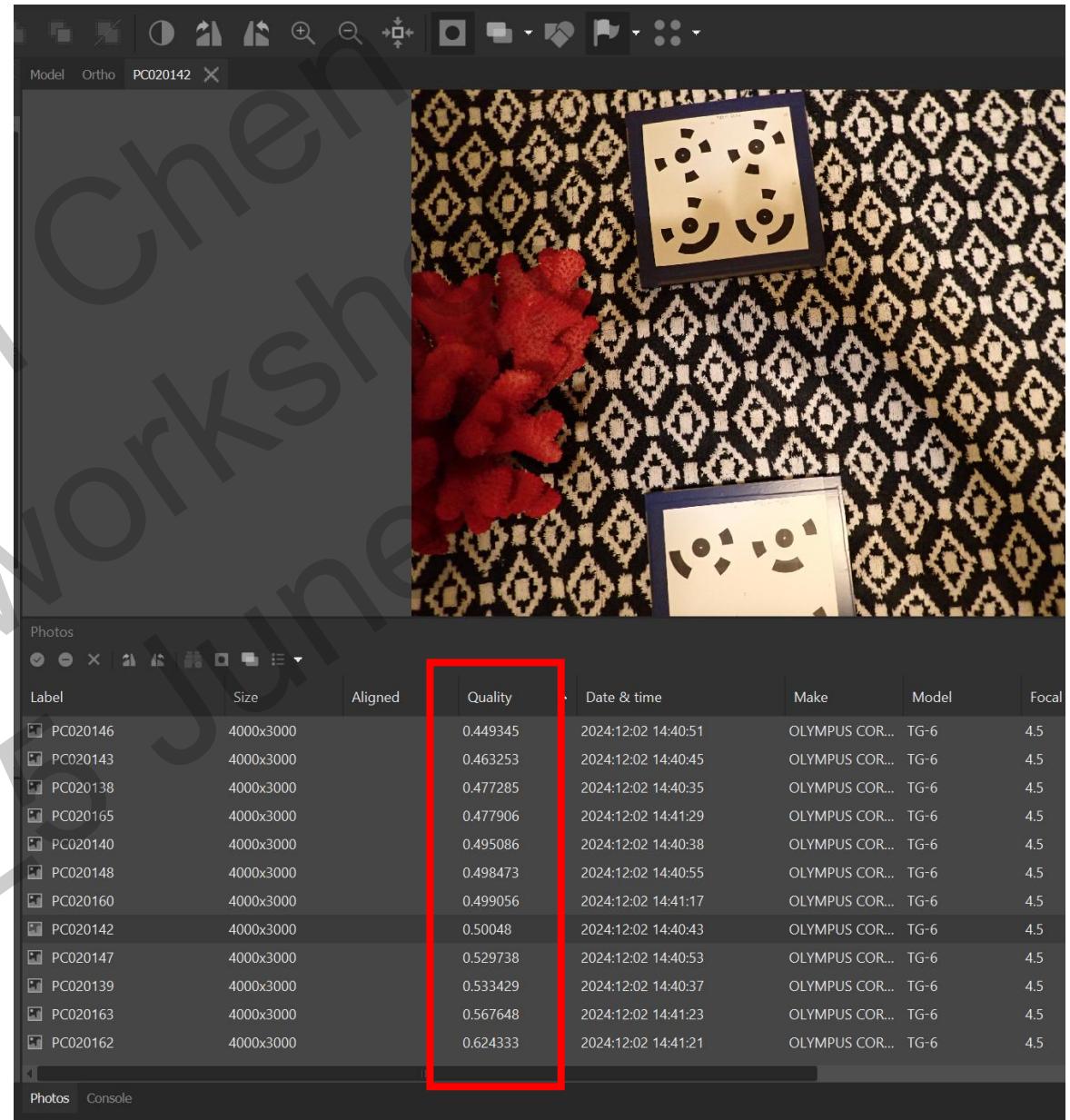
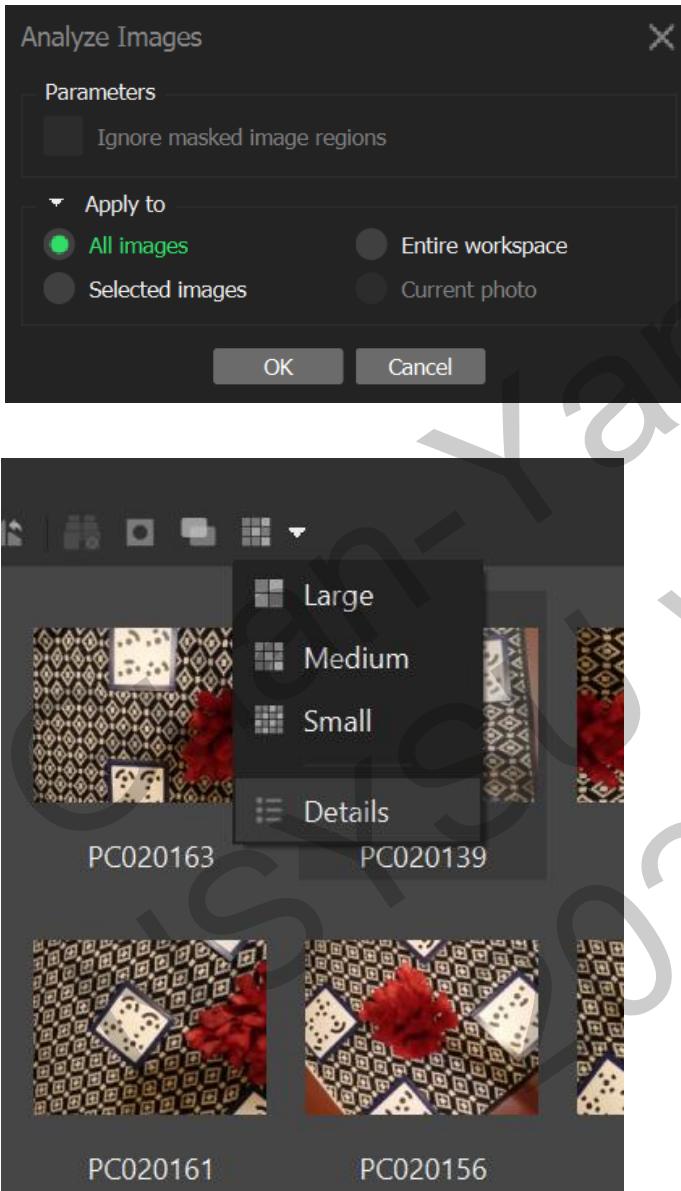
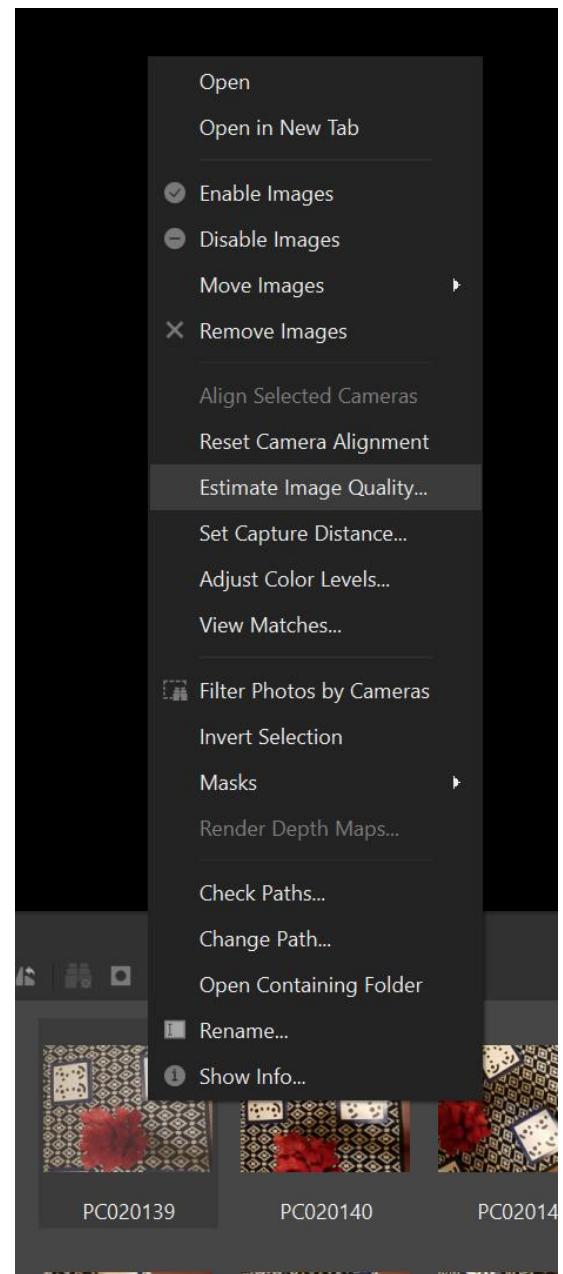
Workspace Reference

Photos Console

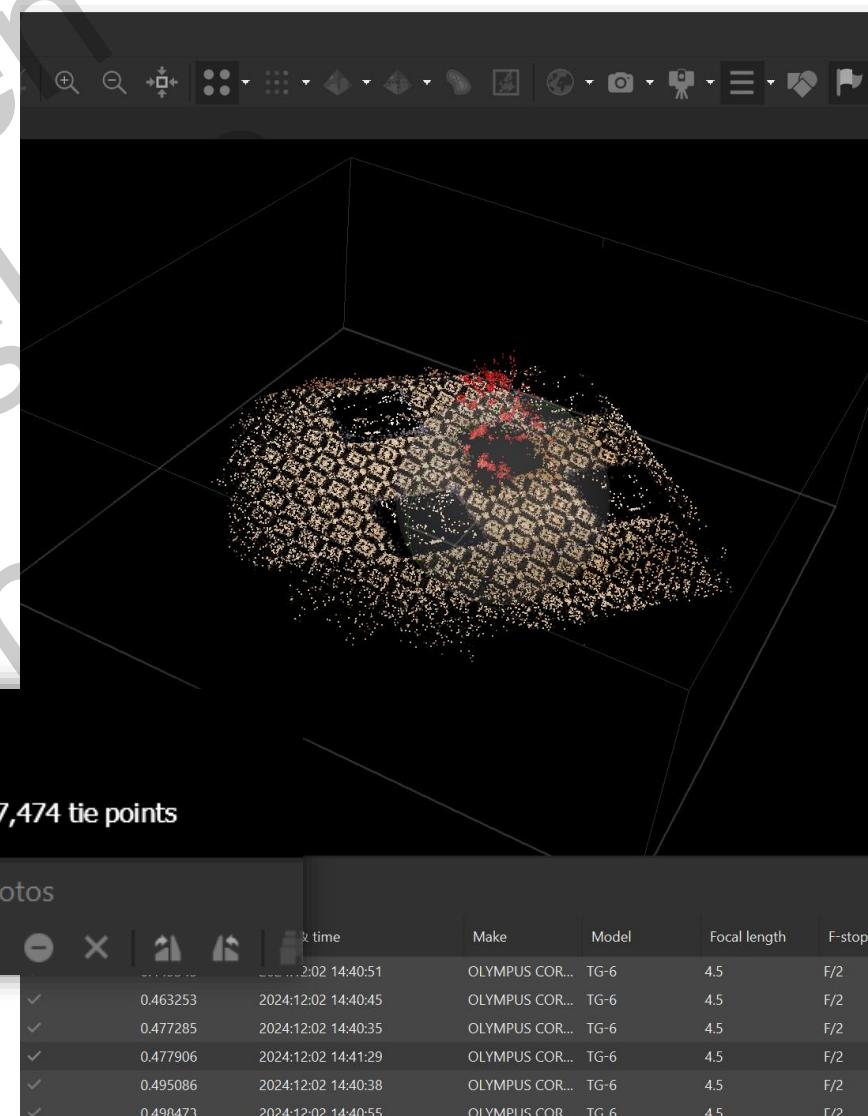
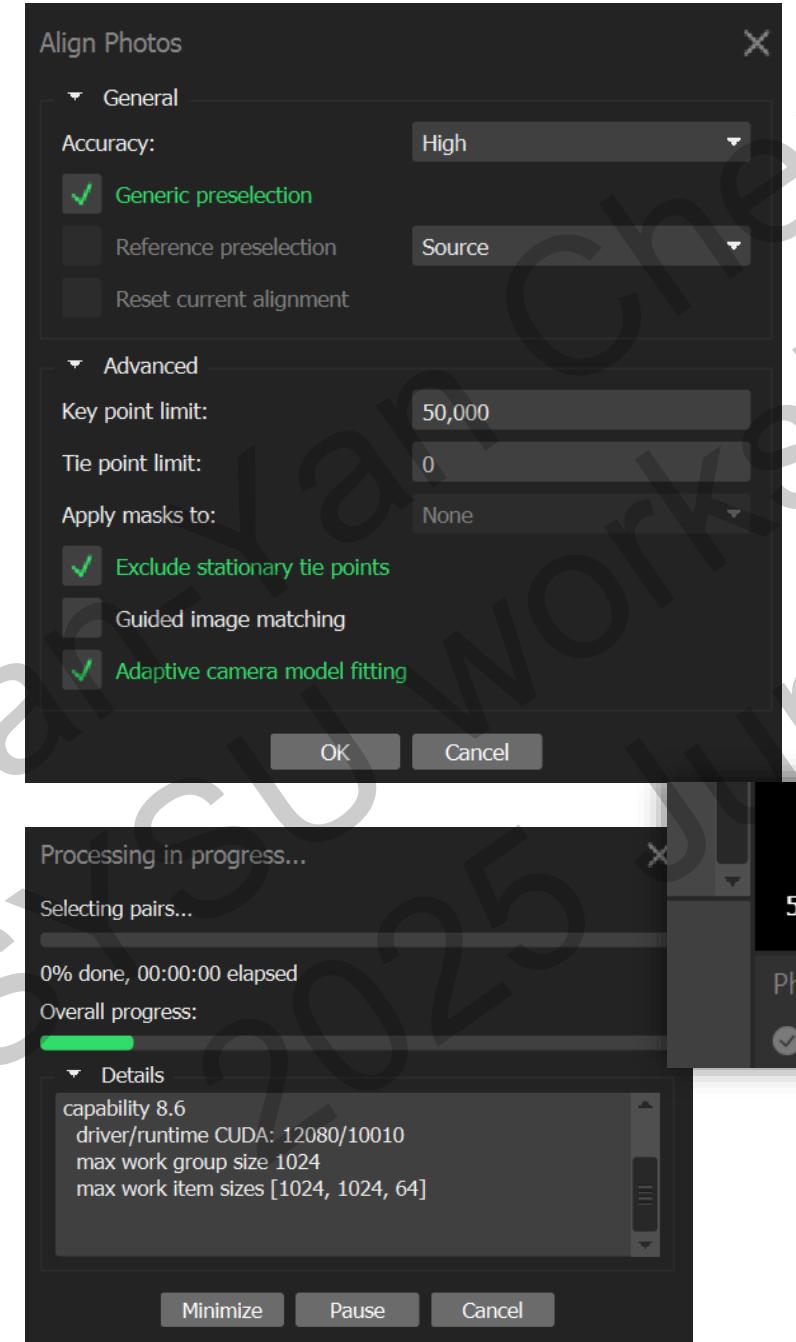
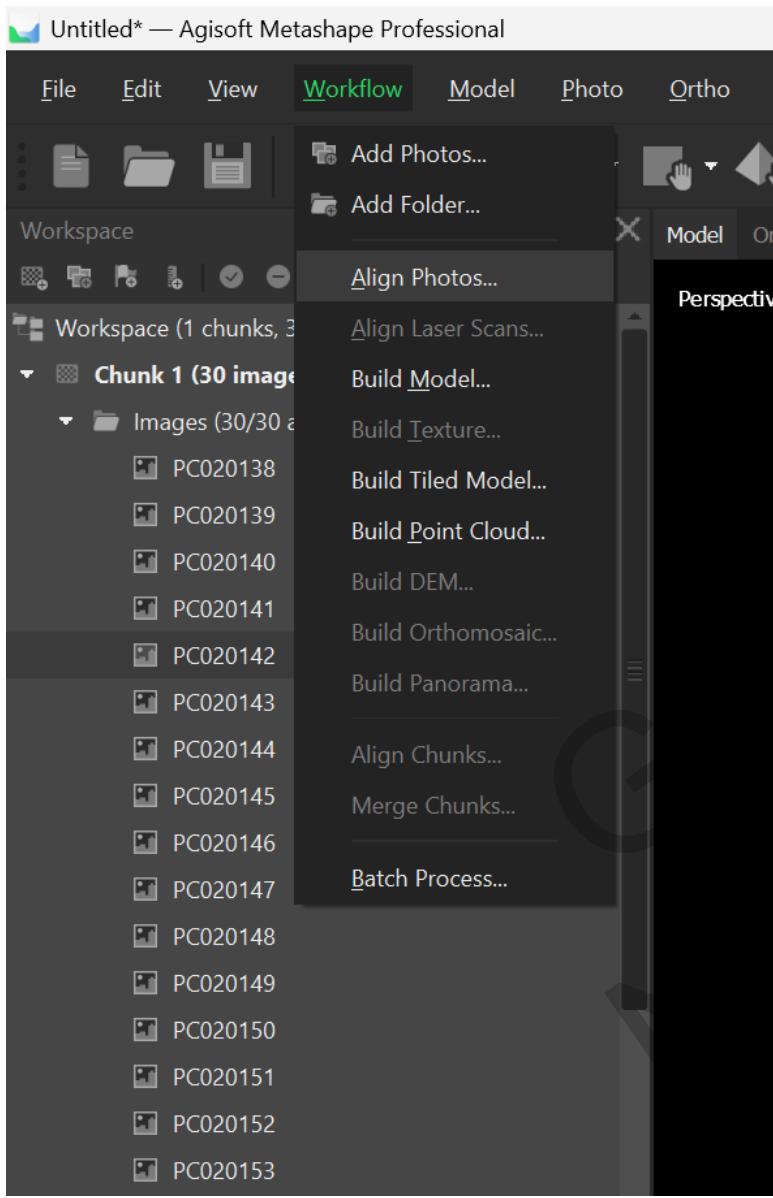


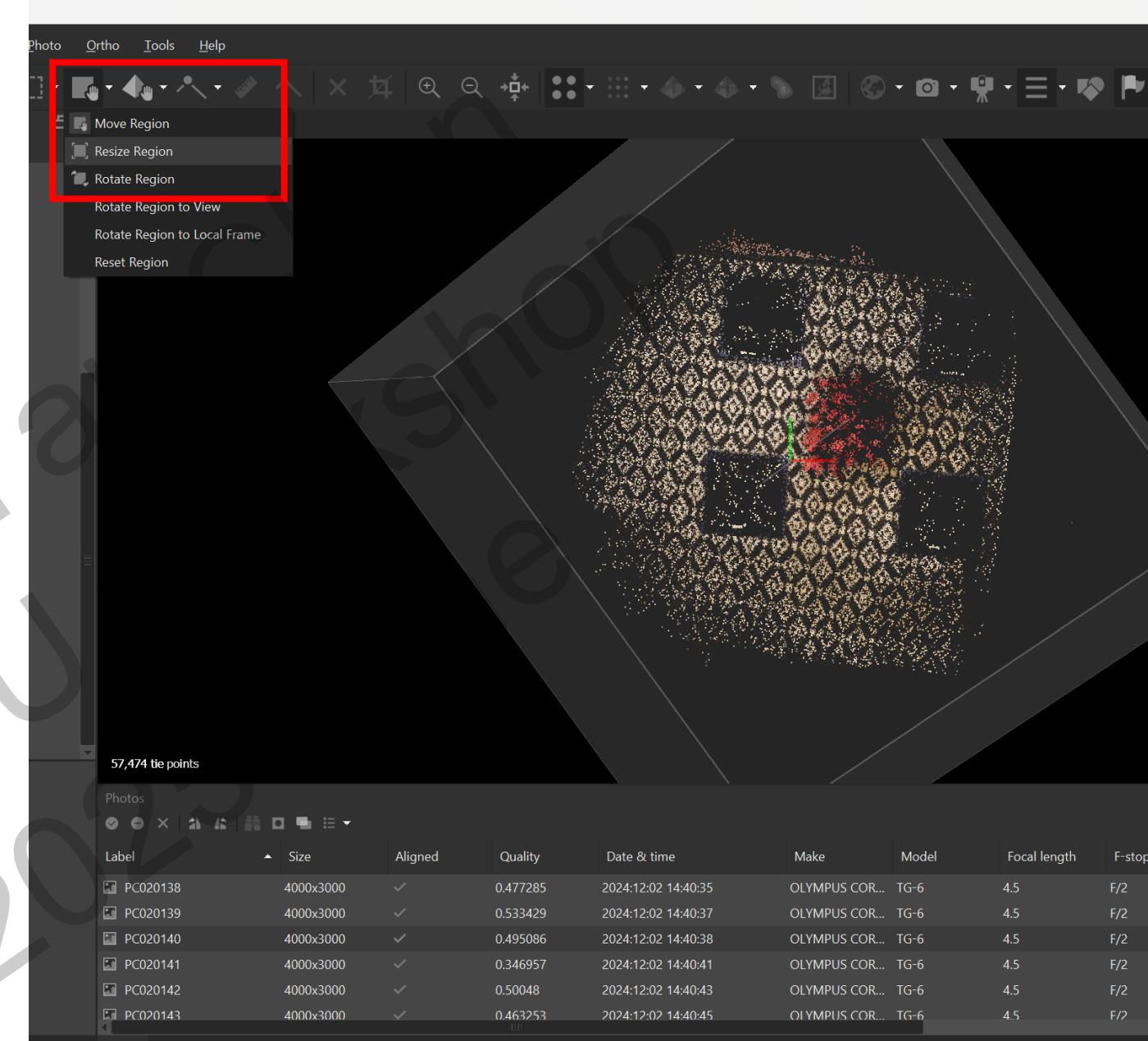
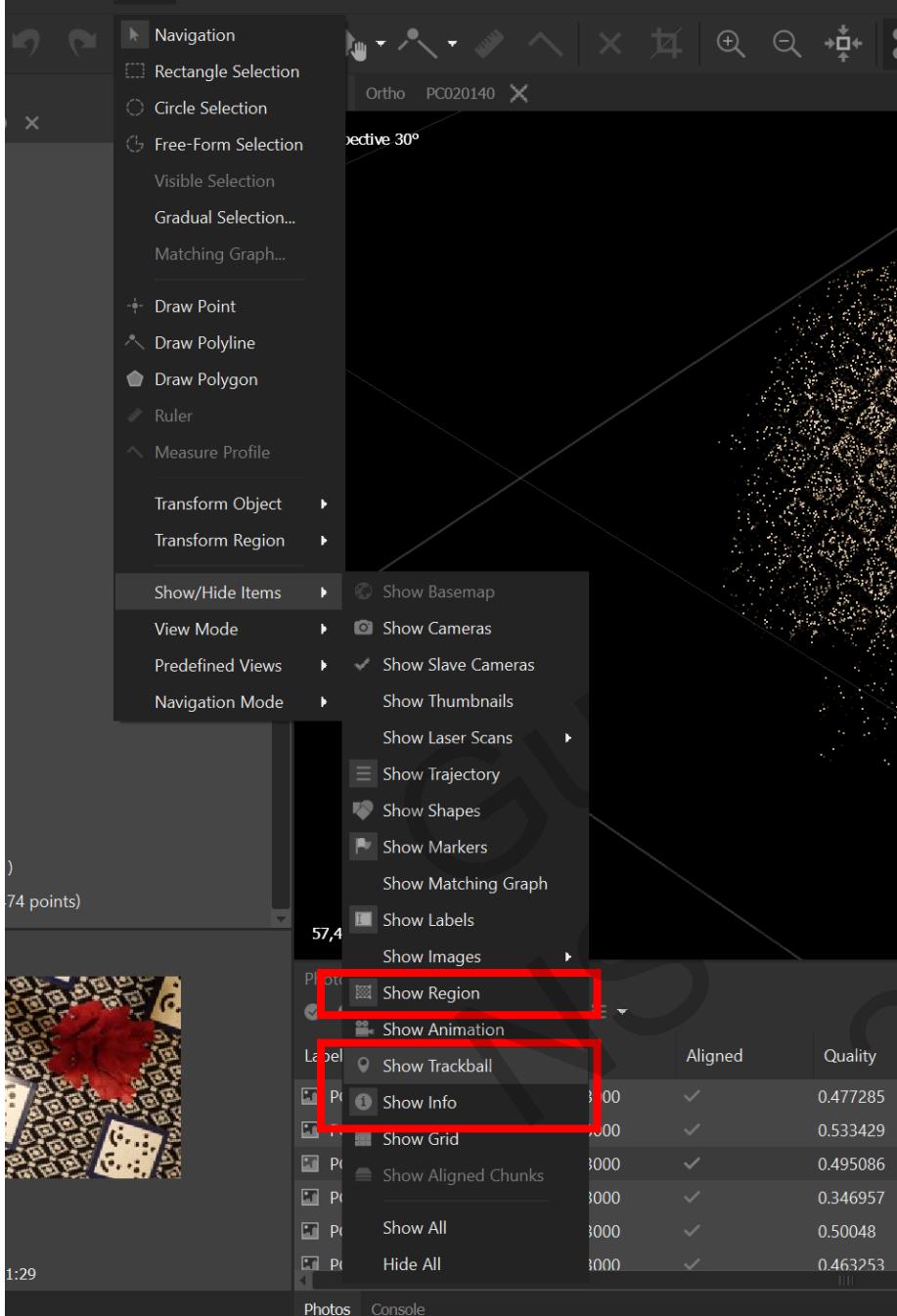
The screenshot shows the 'Reference' panel in the Agisoft Metashape Professional interface. A large downward arrow points from the 'Reference Settings' dialog to the 'Reference' panel. The 'Reference' panel displays a table titled 'Total Error' for 'Control points' and 'Check points'. The columns are Headers, Longitude, Latitude, Altitude (m), and Accuracy (m).

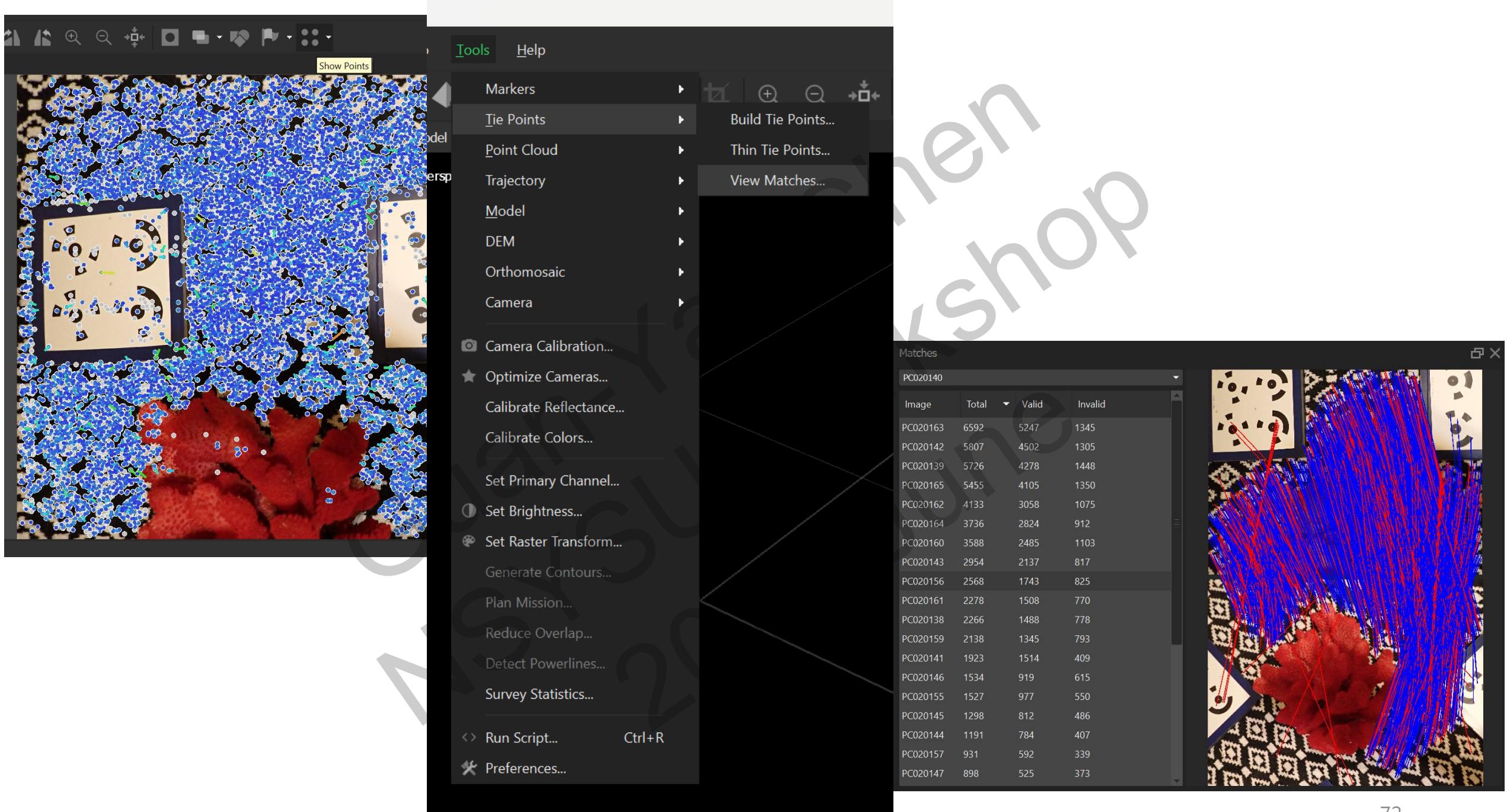
Markers	Longitude	Latitude	Altitude (m)	Accuracy (m)
Total Error				
Control points				
Check points				

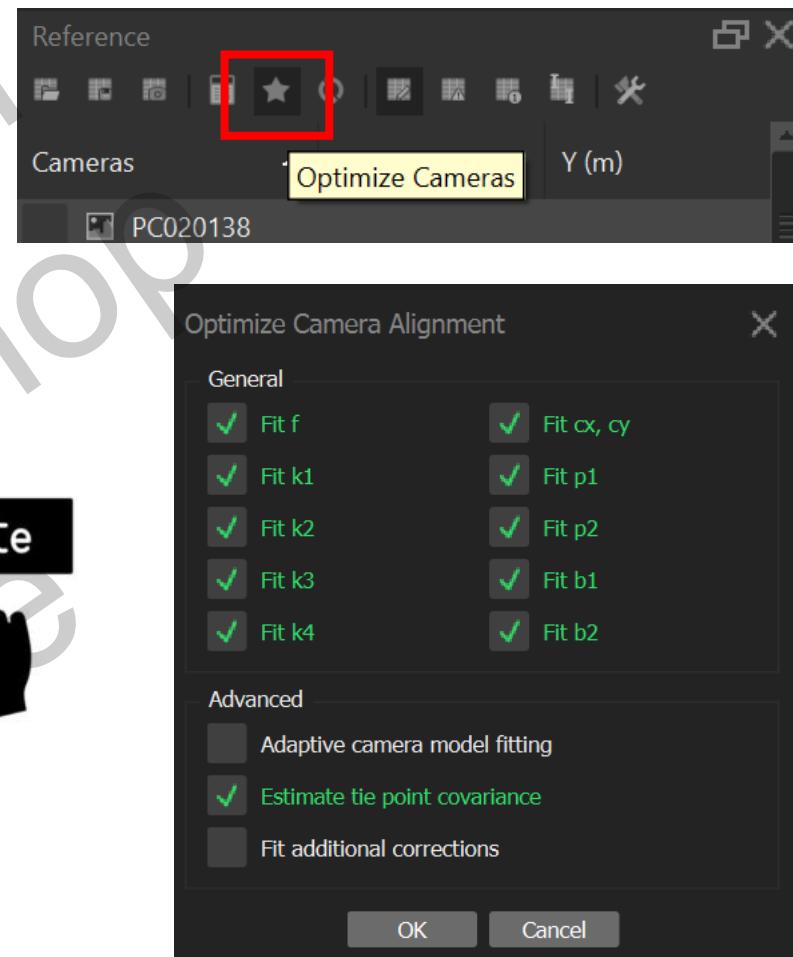
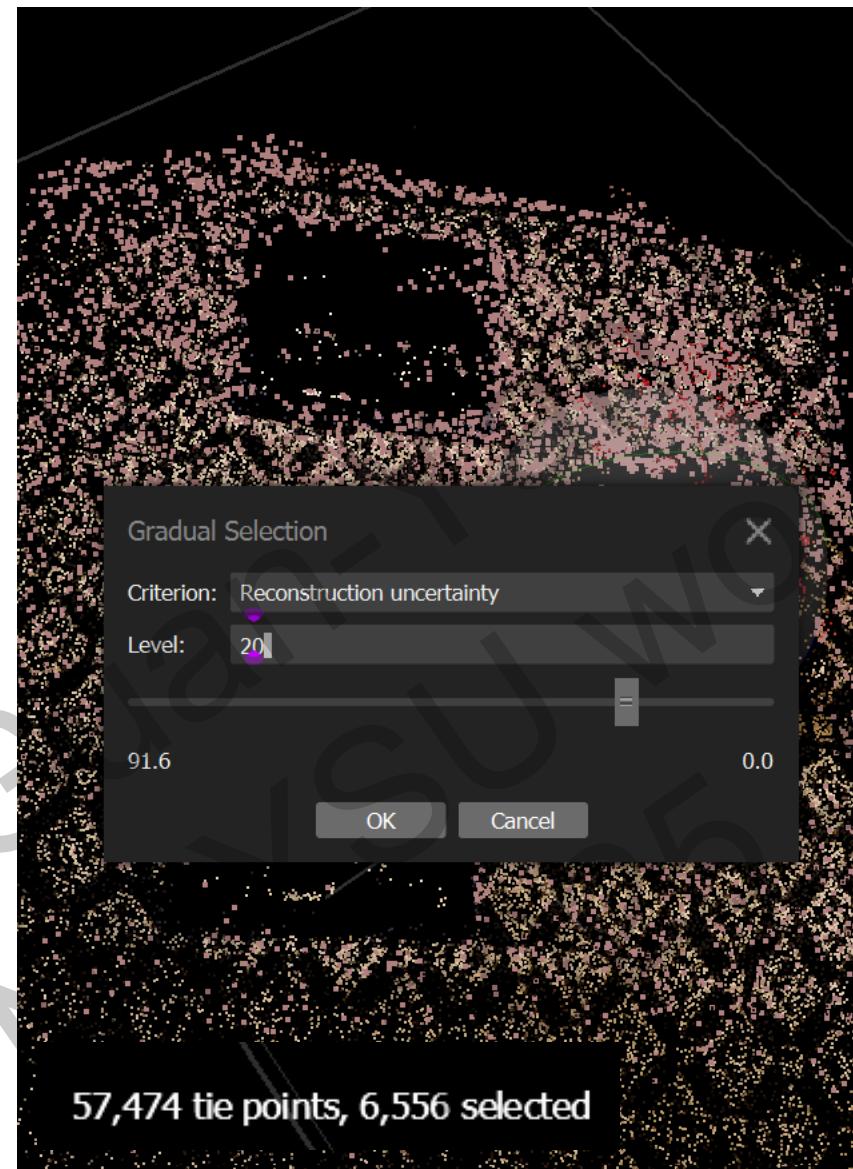
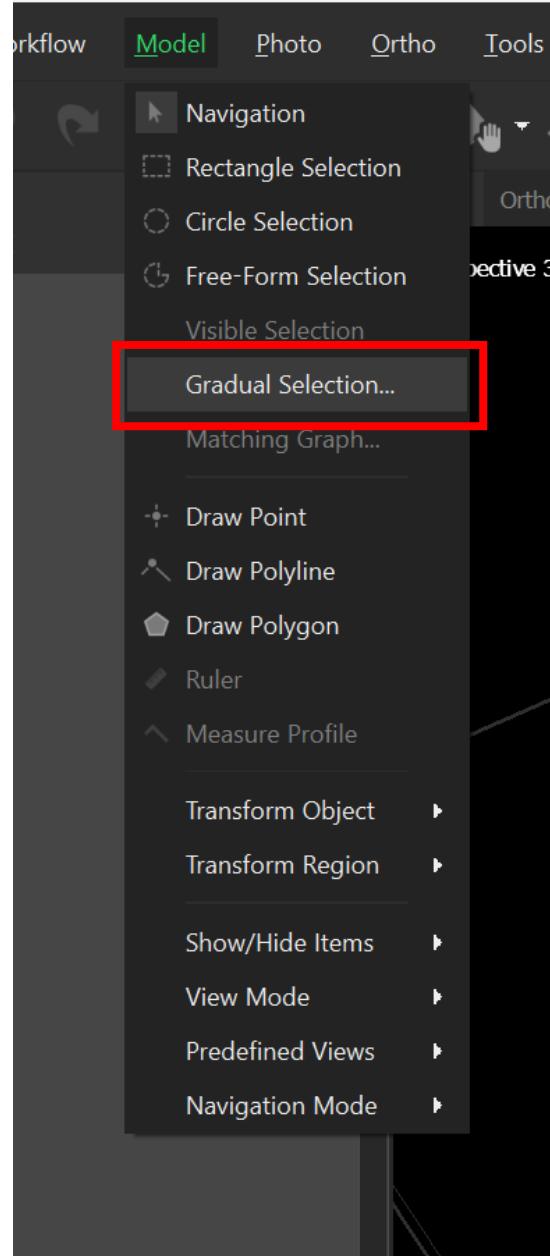


Quality最低門檻視環境而定

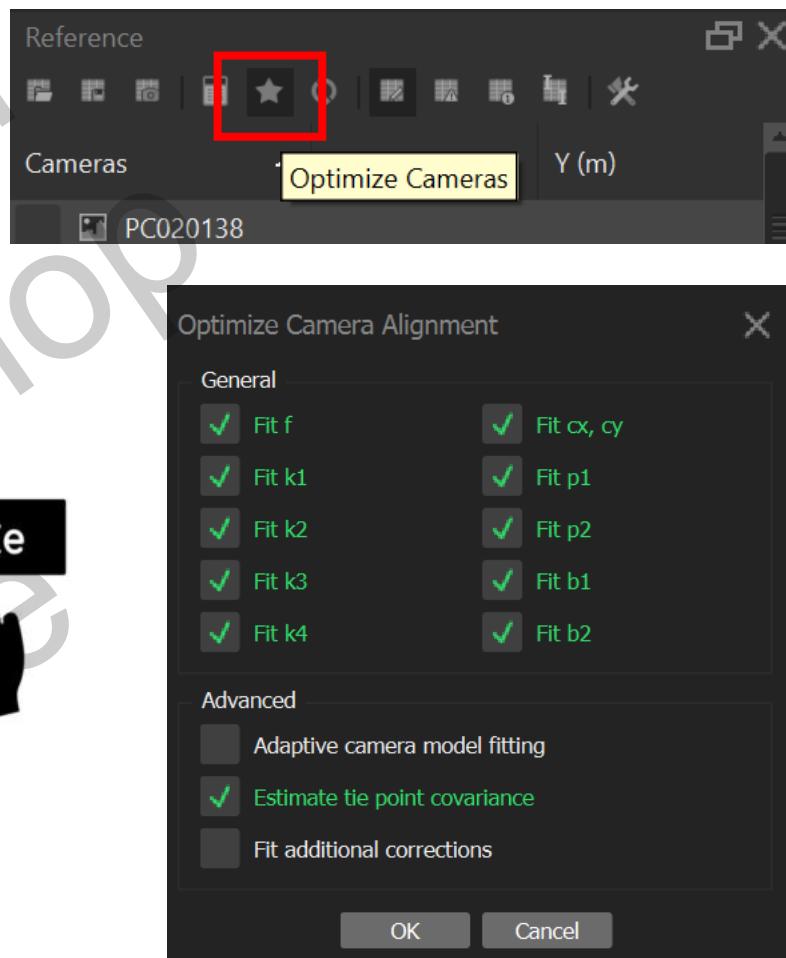
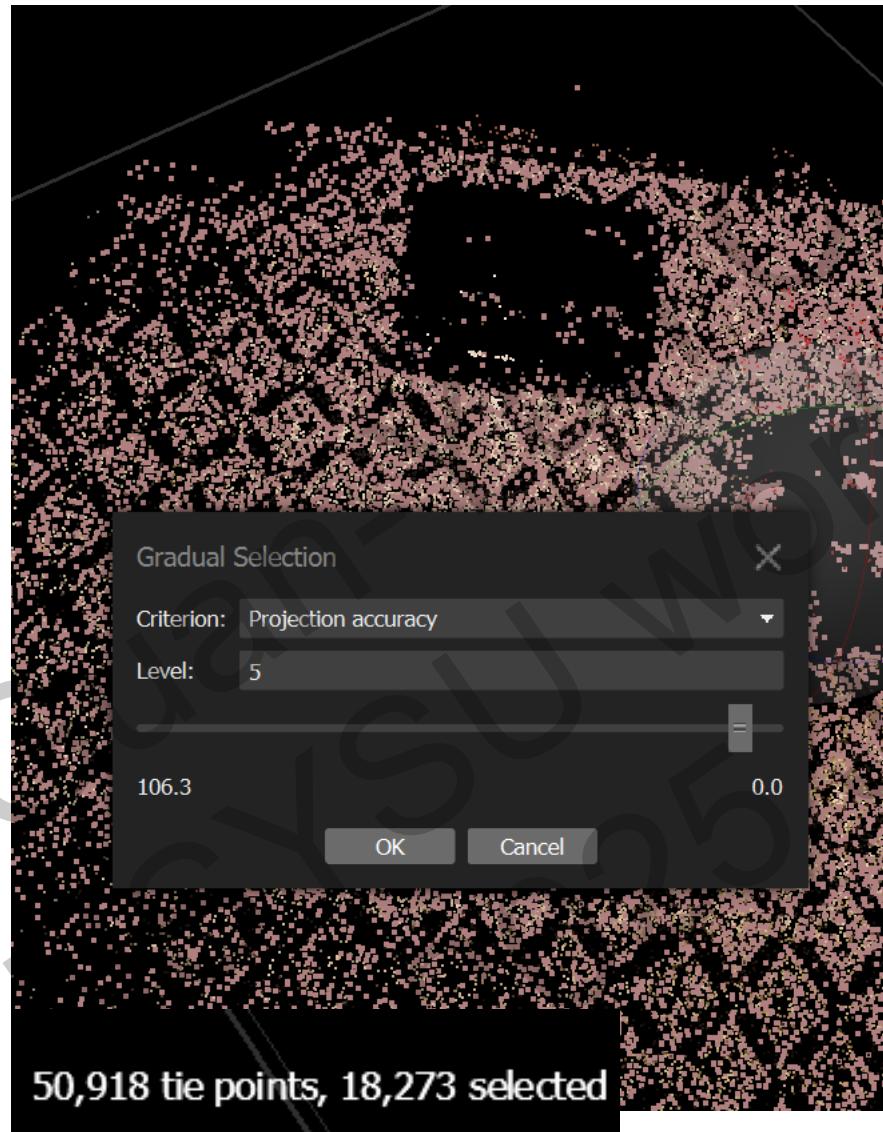
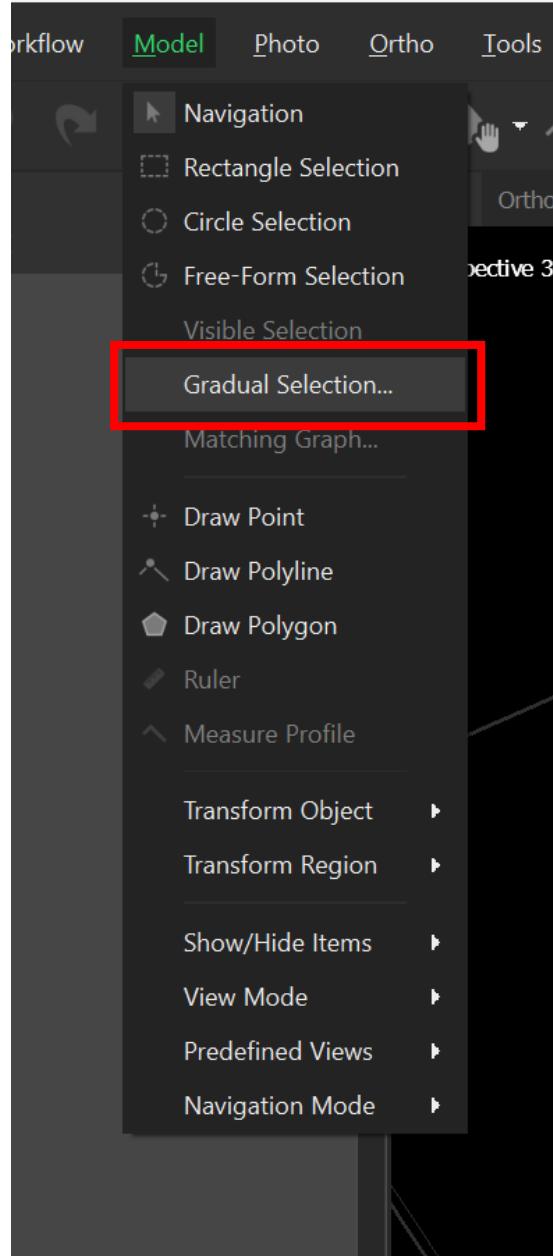






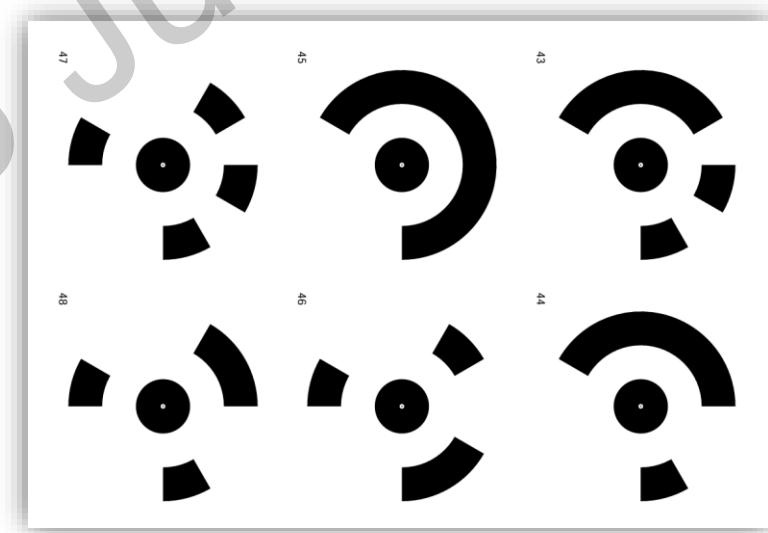
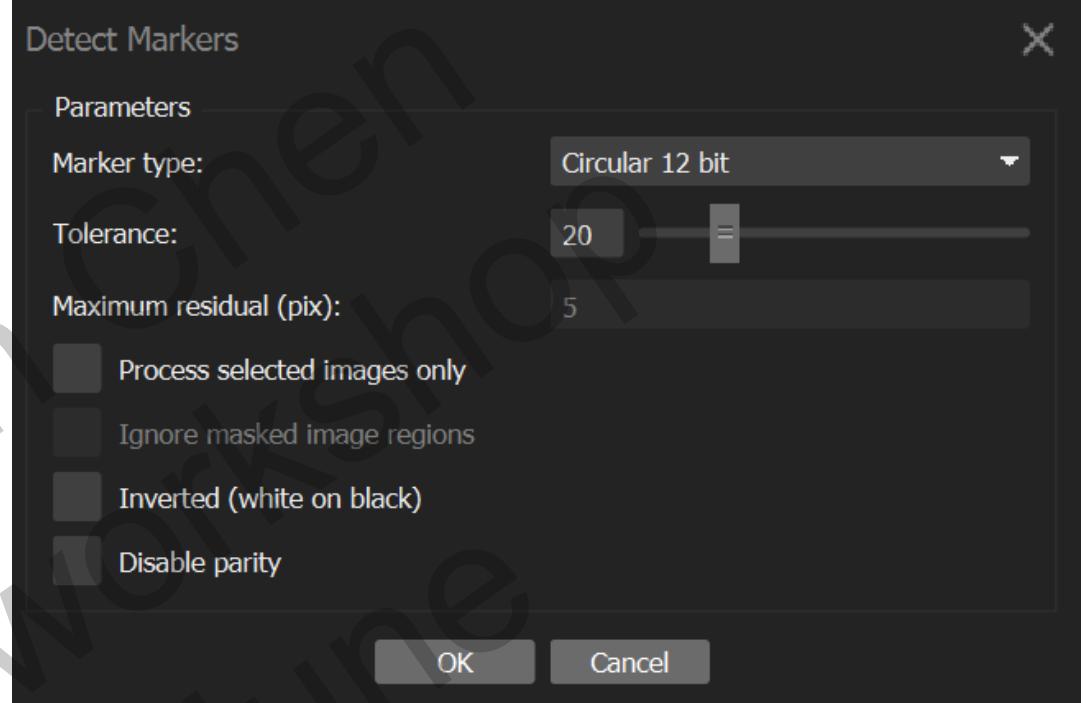
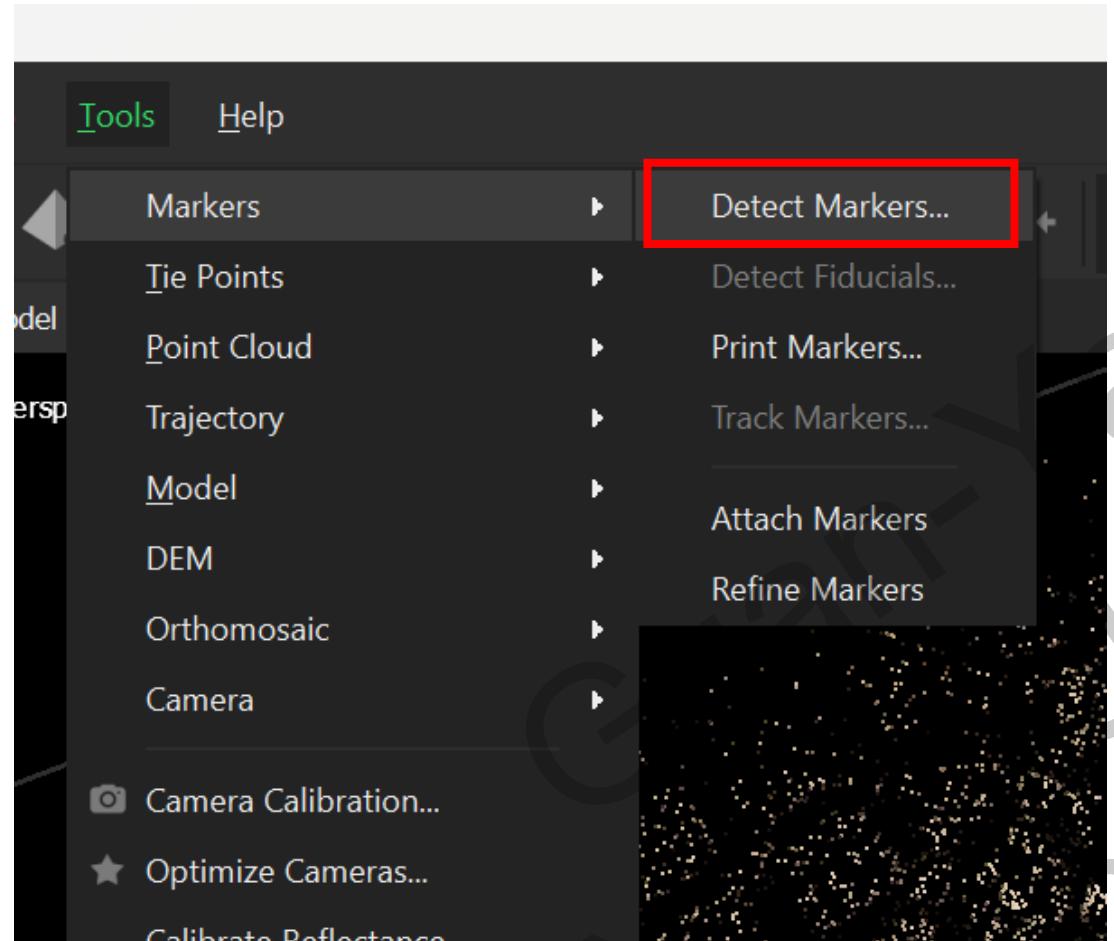


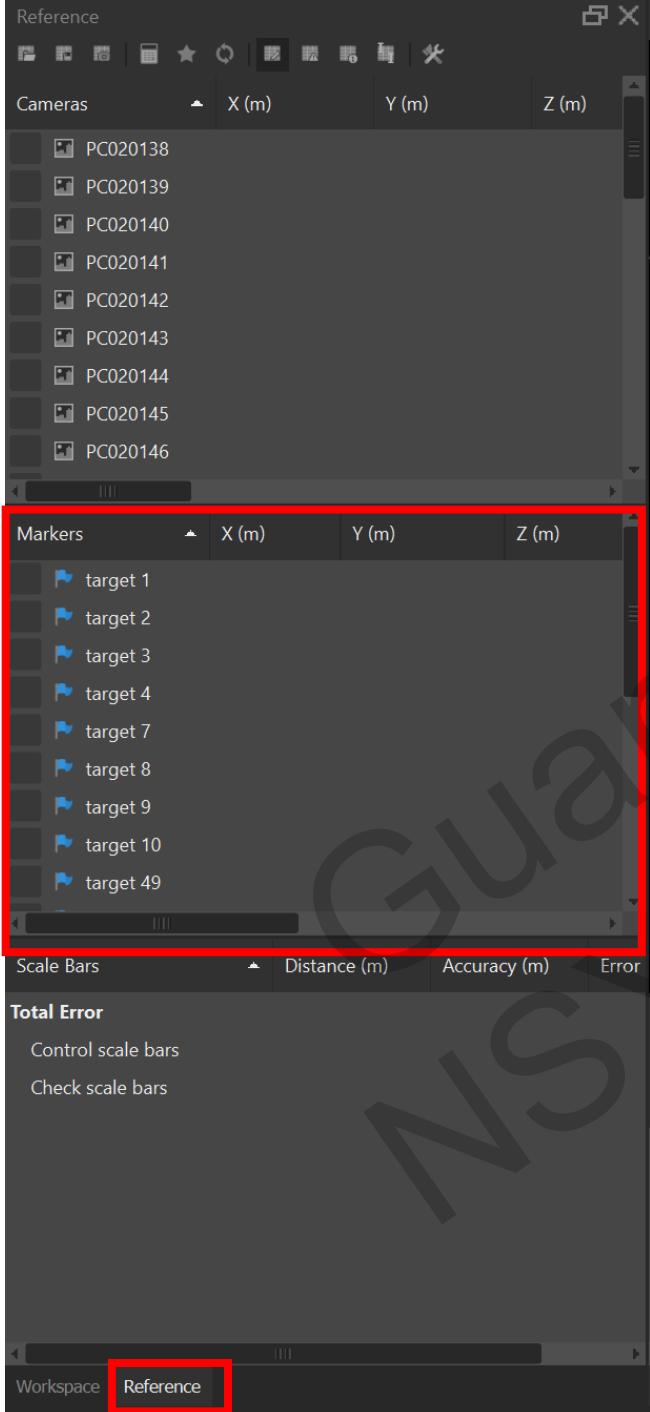
參數	含義
Pixel size (mm)	感測器每個像素的物理尺寸（長 × 高），用來把焦距從「像素」轉成「毫米」。
Focal length (mm)	鏡頭標稱的焦距；在下方 f 參數校正後以像素為單位重新估算。
f	校正後的「有效焦距」，以像素(px)為單位。 $= (\text{Focal length} \div \text{Pixel size}) + \text{校正偏移}$
cx, cy	主點 (Principal Point) 在影像座標中的位置，單位為像素(px)。通常偏離影像中心即代表光心與感測器中心輕微不對齊。
$k1, k2, k3, k4$	徑向畸變係數 (Radial Distortion) <ul style="list-style-type: none"> - $k1$：一階（主要）桶／枕形畸變 - $k2$：二階次補償 - $k3, k4$：更高階調整
$p1, p2$	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>

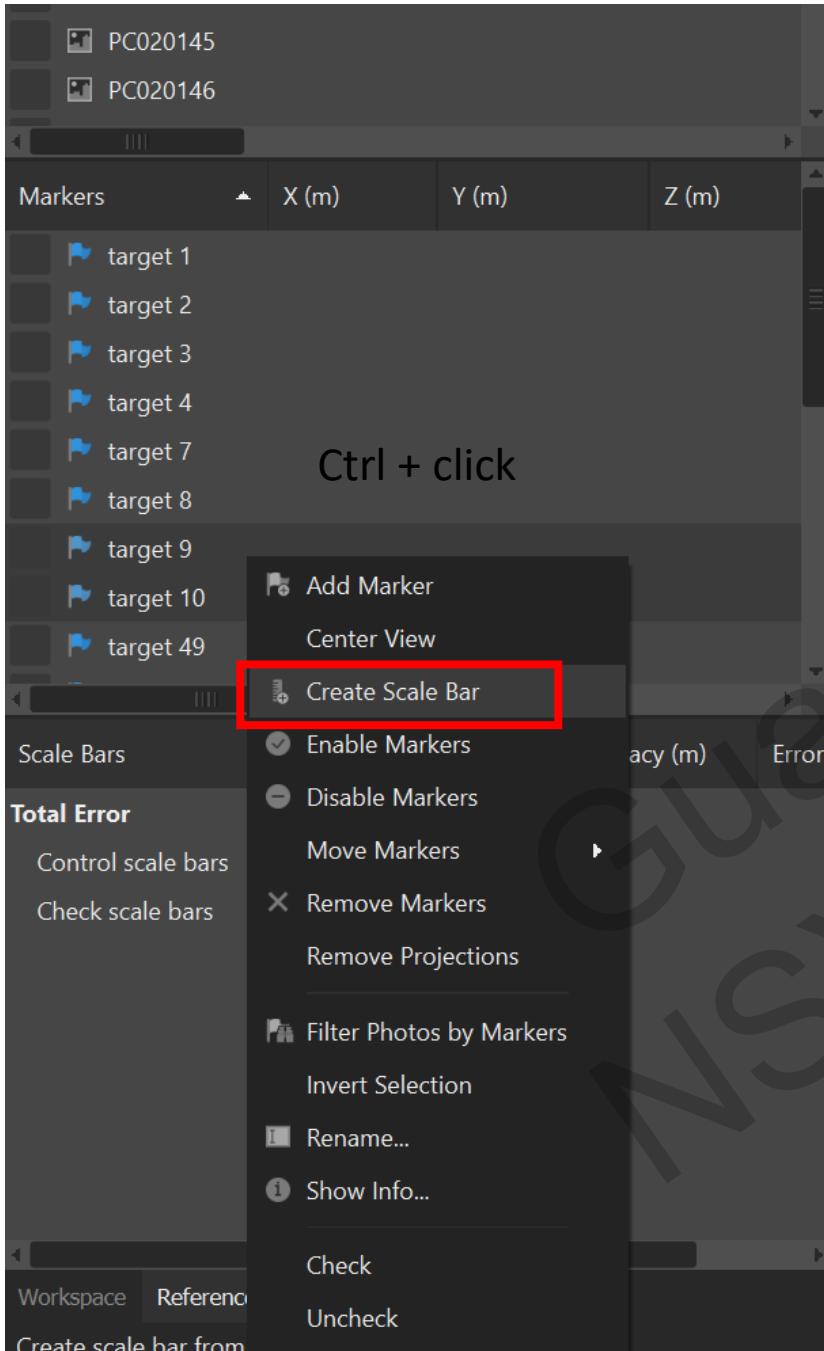


在 Metashape 的 Model → Gradual Selection... 對話框中，你可以依據以下幾項準則逐步篩除品質較差的稀疏點 (tie points)：

選項	含義
Reconstruction uncertainty (重建不確定度)	<ul style="list-style-type: none">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。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。
Projection accuracy (投影精度)	<ul style="list-style-type: none">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。大值往往意味著此點的匹配在影像平面上不夠準確。
Reprojection error (重投影誤差)	<ul style="list-style-type: none">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。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。
Image count (圖像數量)	<ul style="list-style-type: none">該 3D 點被成功匹配到的影像張數（至少要 ≥ 2 張才能重建）。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。







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 marked with a green checkmark:

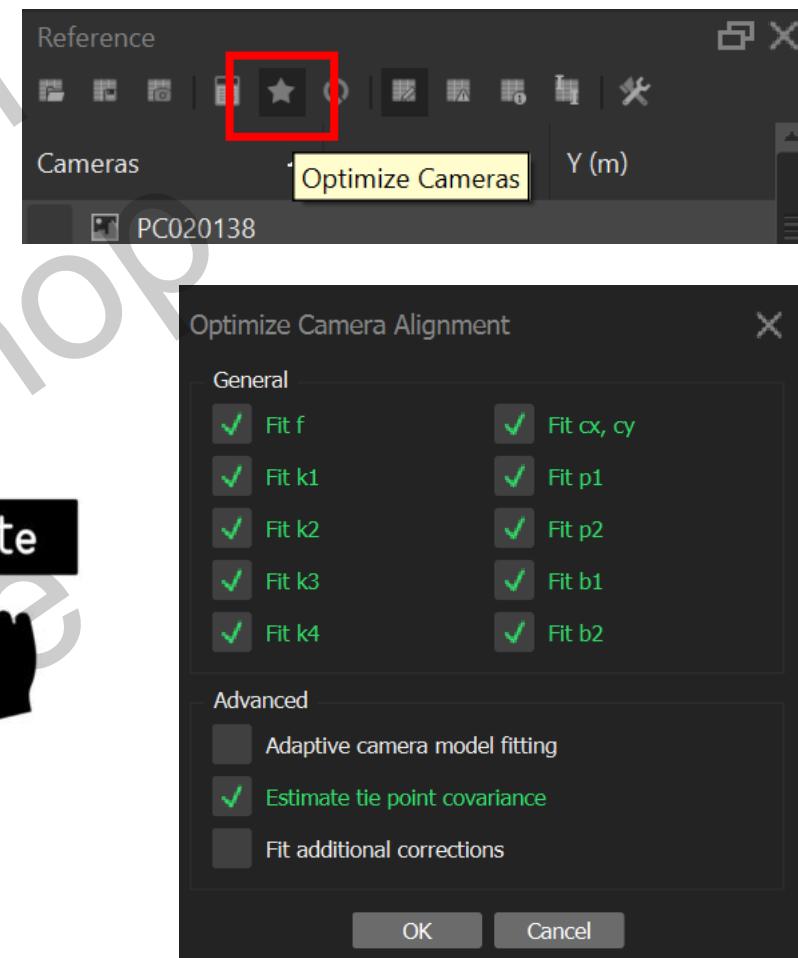
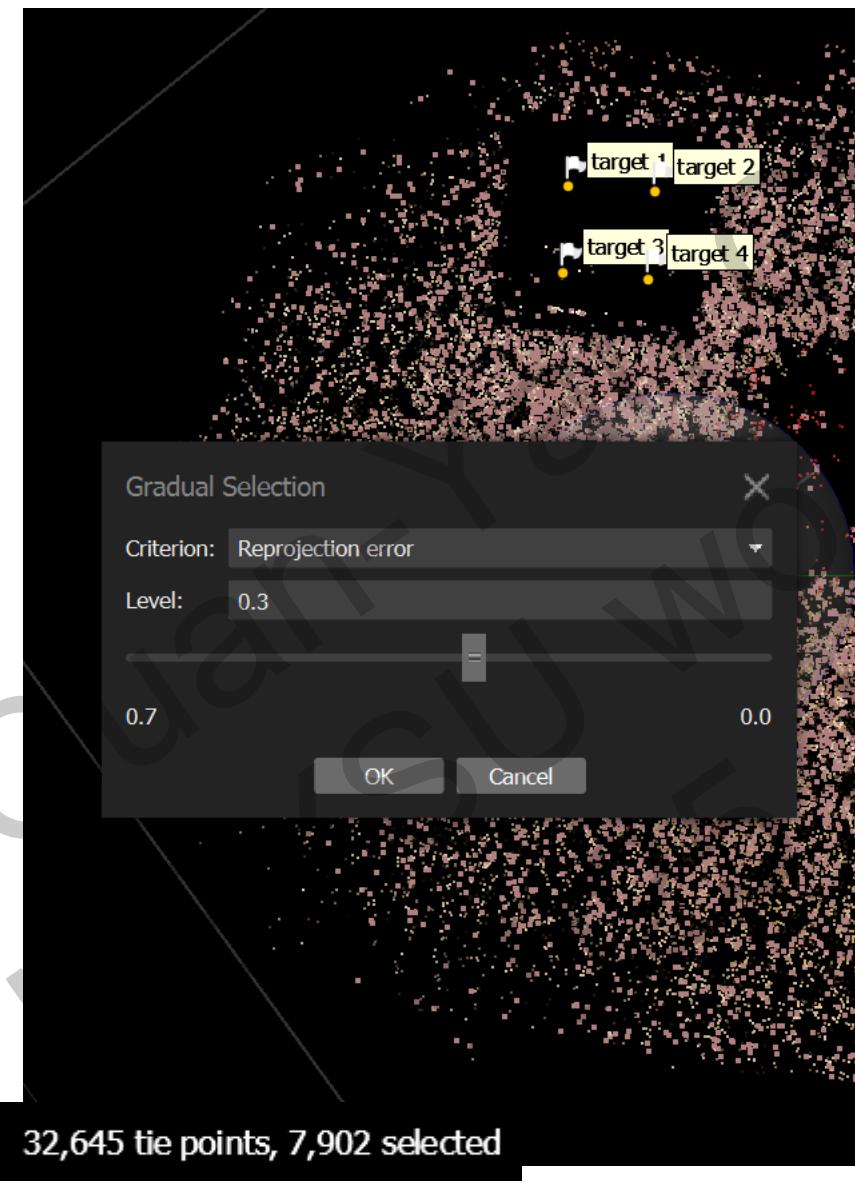
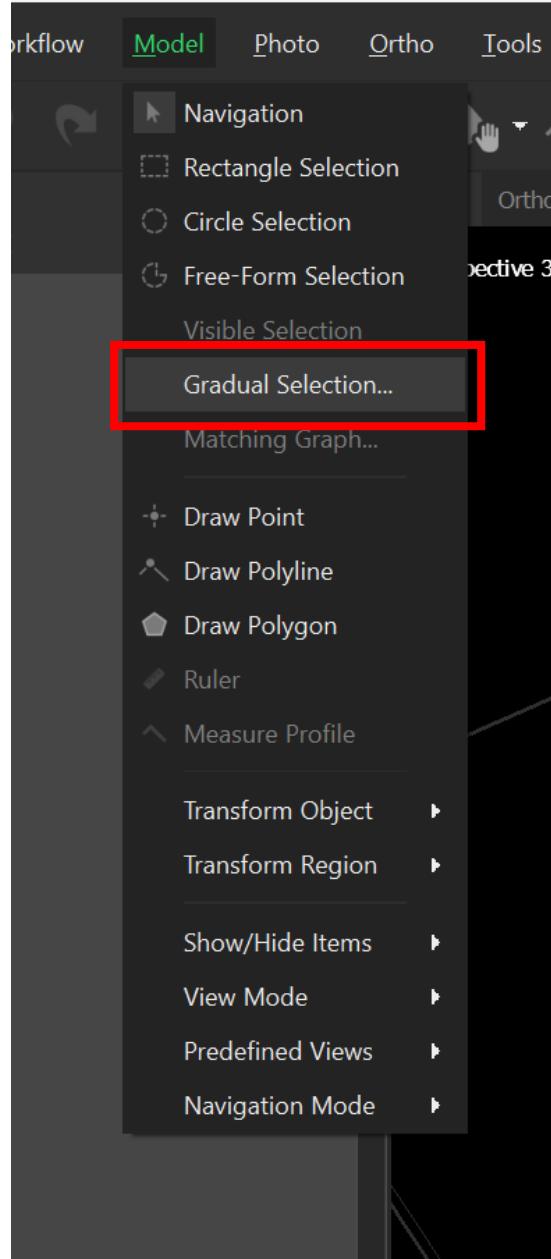
	Distance (m)	Accuracy (m)	Error (m)
target 9_target 10	0.058200	0.001000	
target 49_target 50	0.055800	0.001000	
target 55_target 56	0.055600	0.001000	

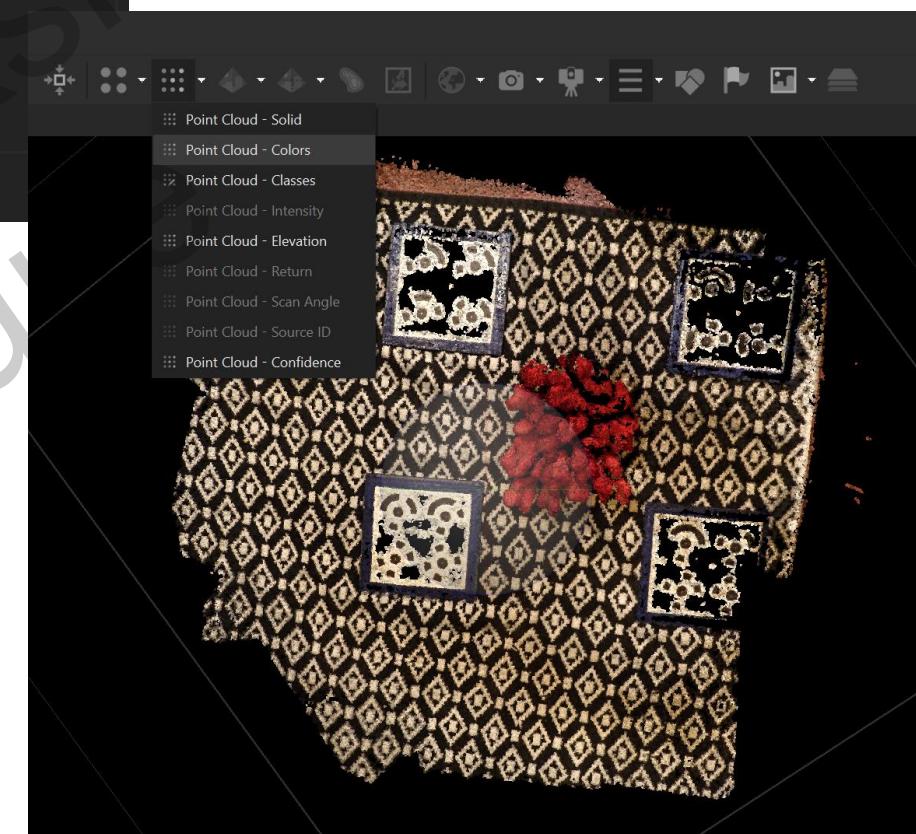
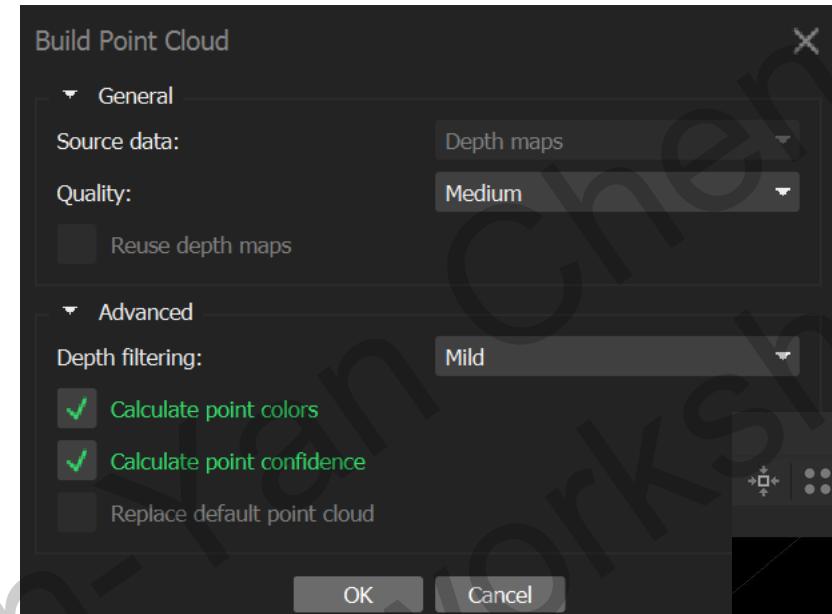
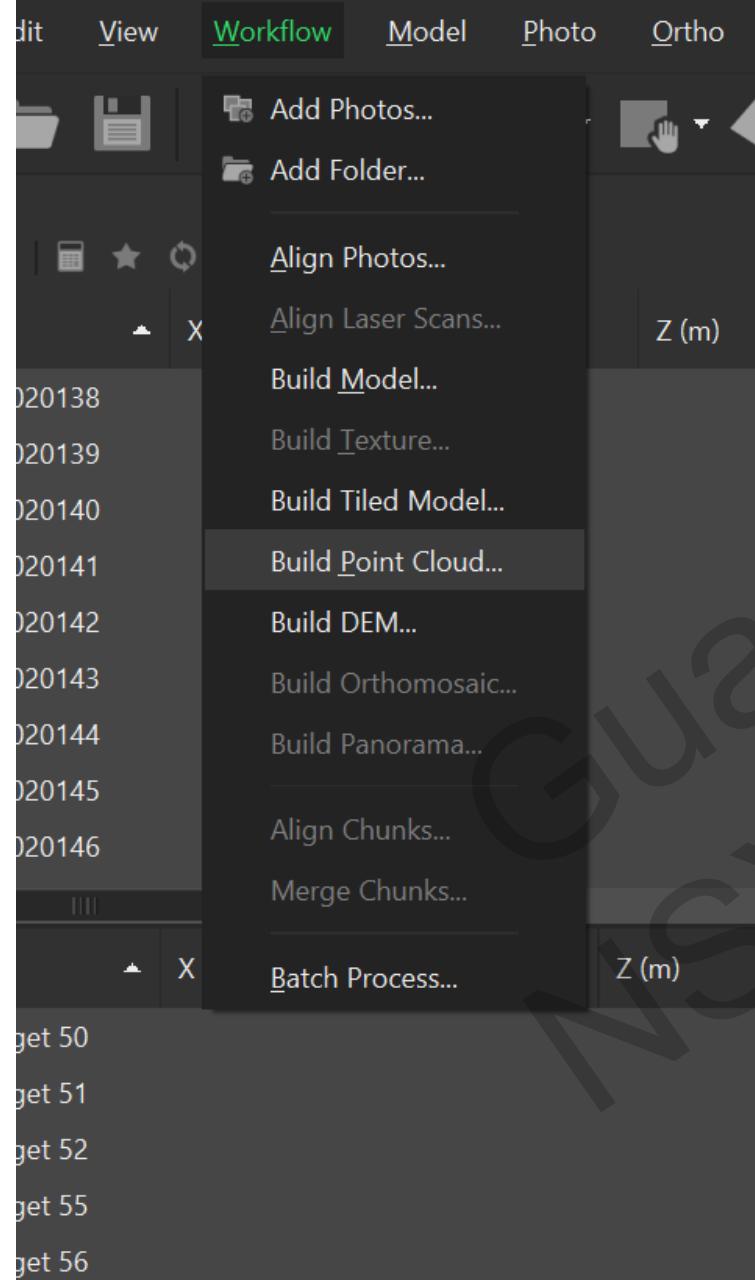
A screenshot of a software interface showing a 'Reference' section with icons and a 'Cameras' section listing 'PC020138' and 'PC020139'. Below the cameras is a yellow-highlighted text field labeled 'Update Transform' with '(m)' next to it. A large white arrow points downwards from the 'Create Scale Bar'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

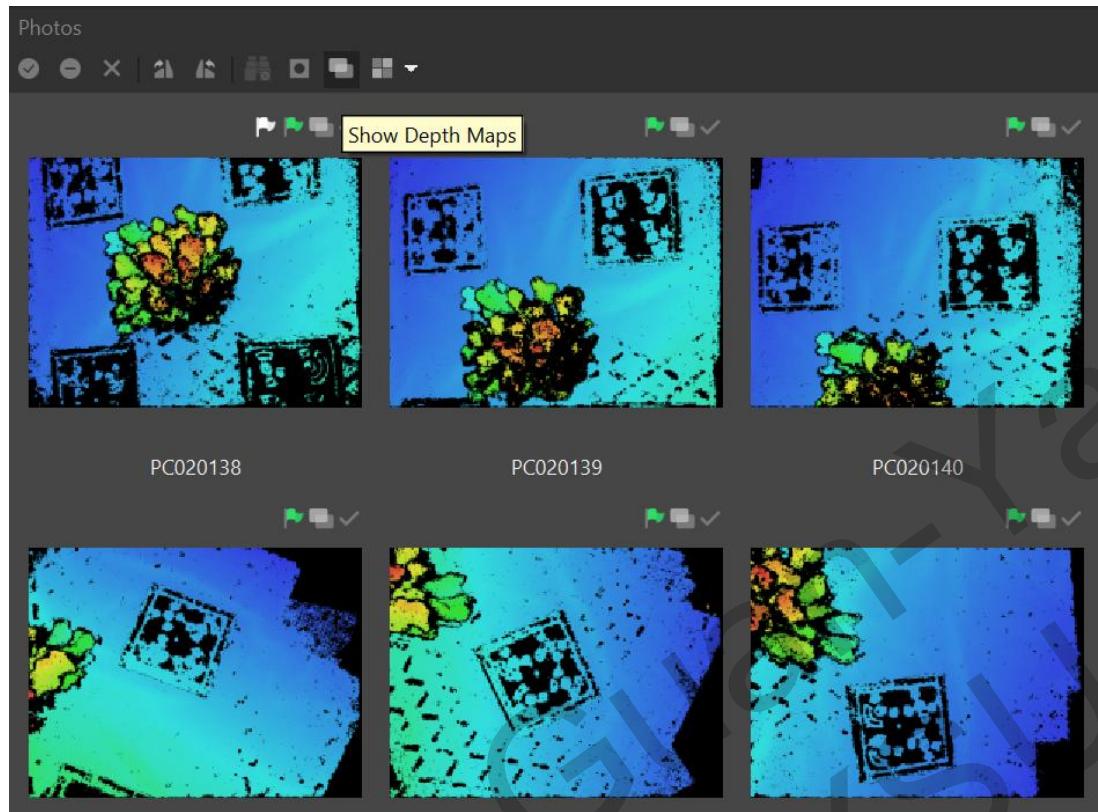
A screenshot of a software interface showing a table titled 'Scale Bars'. The columns are 'Distance (m)', 'Accuracy (m)', and 'Error (m)'. The same three rows are listed, but the 'Error (m)' values have been updated:

	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

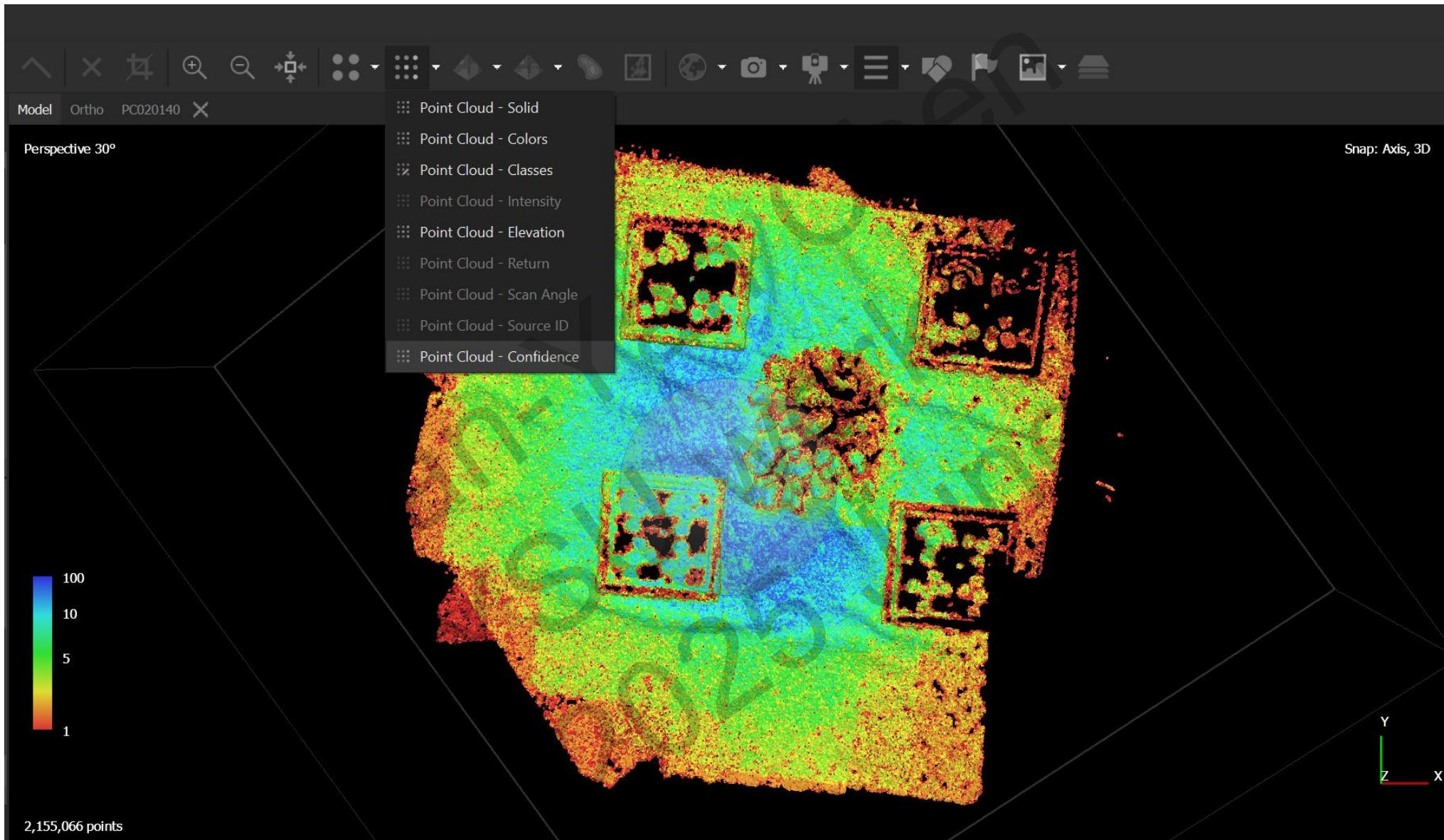
Below the table, under 'Total Error', the 'Check scale bars' value is shown as 0.000193. A large white arrow points downwards from the 'Update Transform' field in the second screenshot to the 'Check scale bars' value in this screenshot.

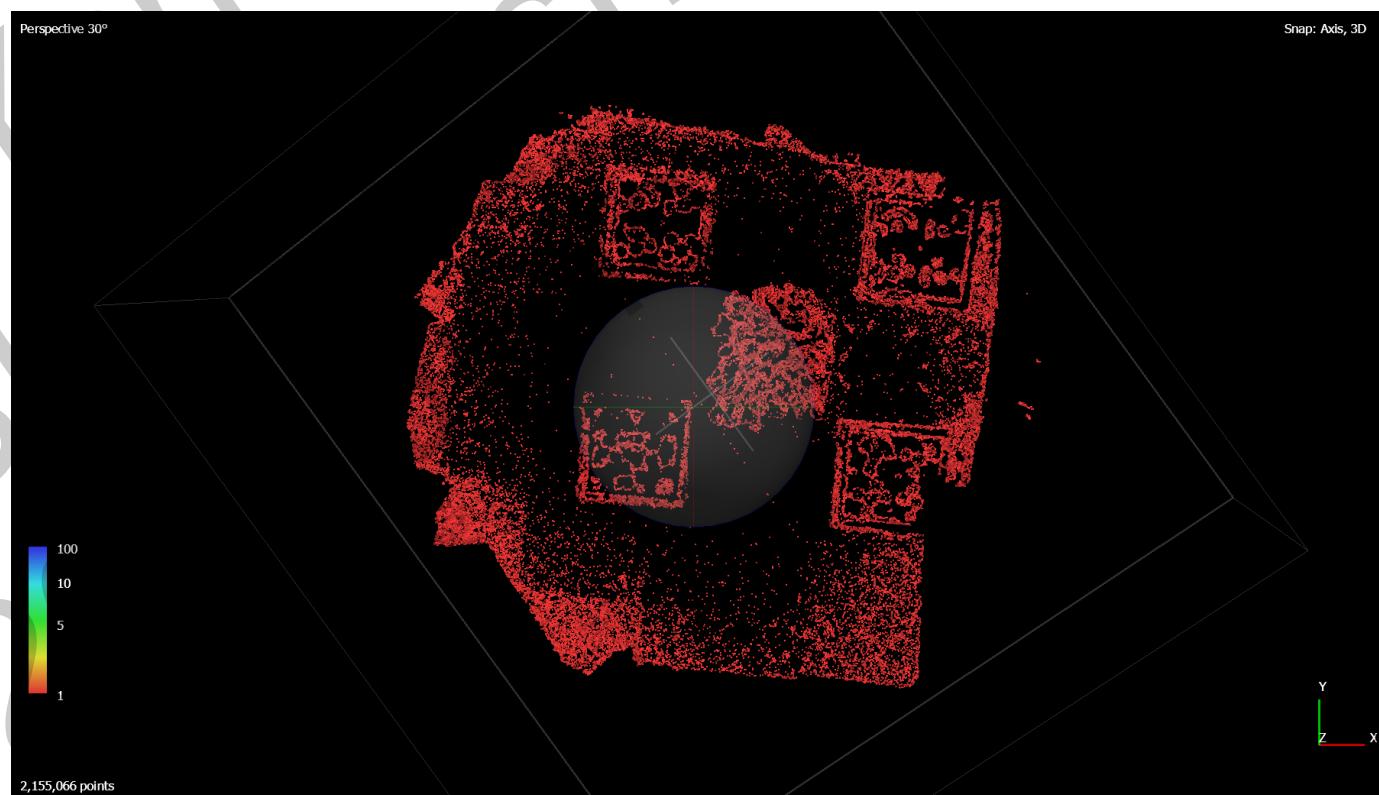
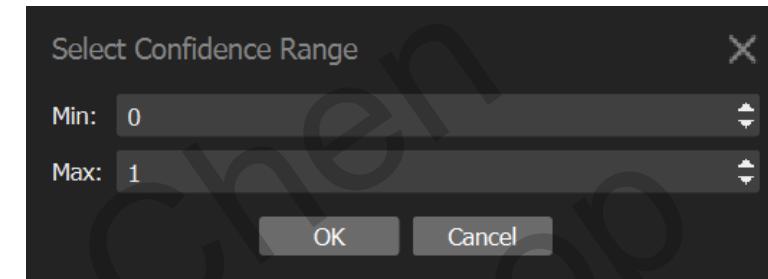
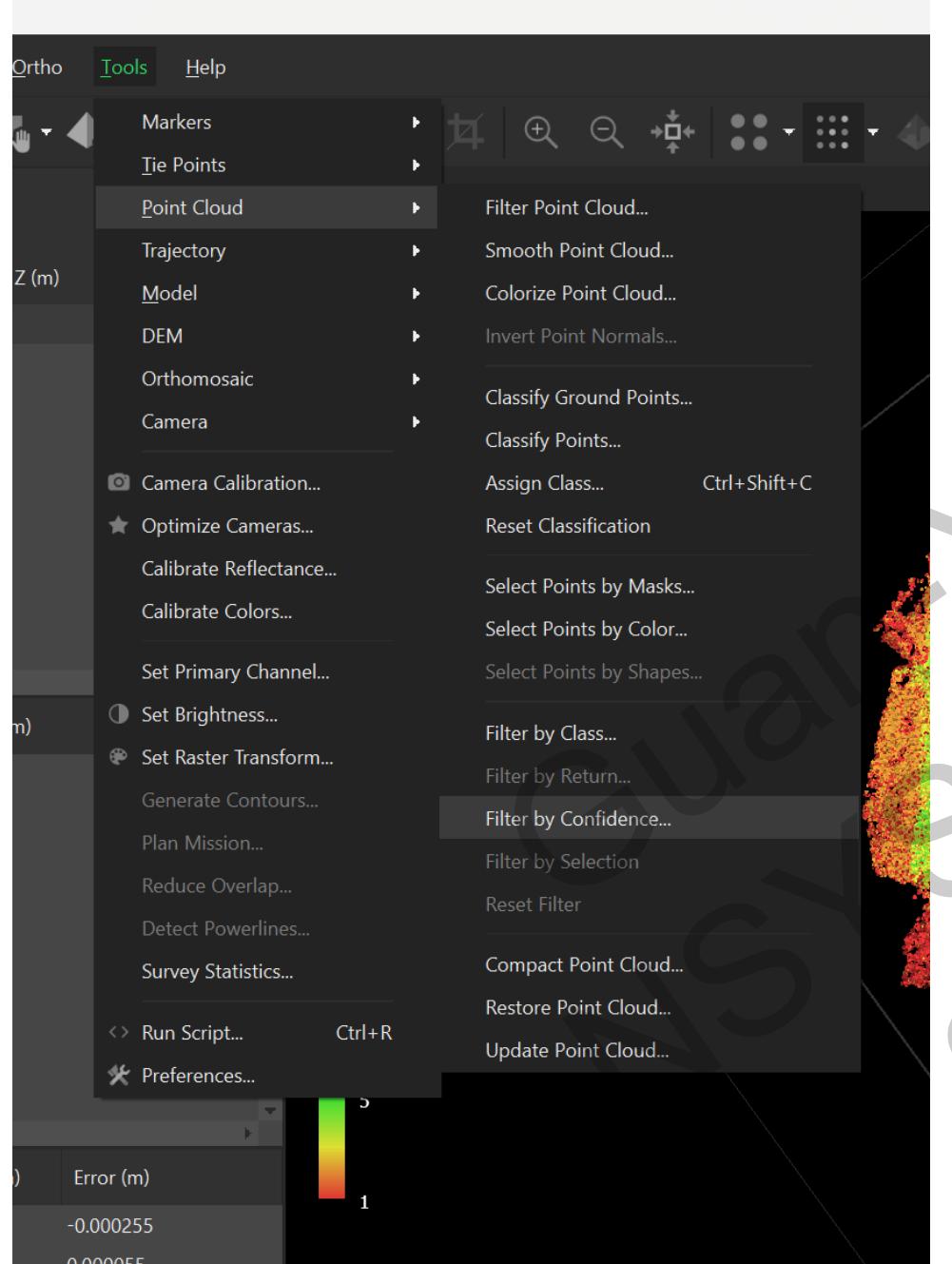


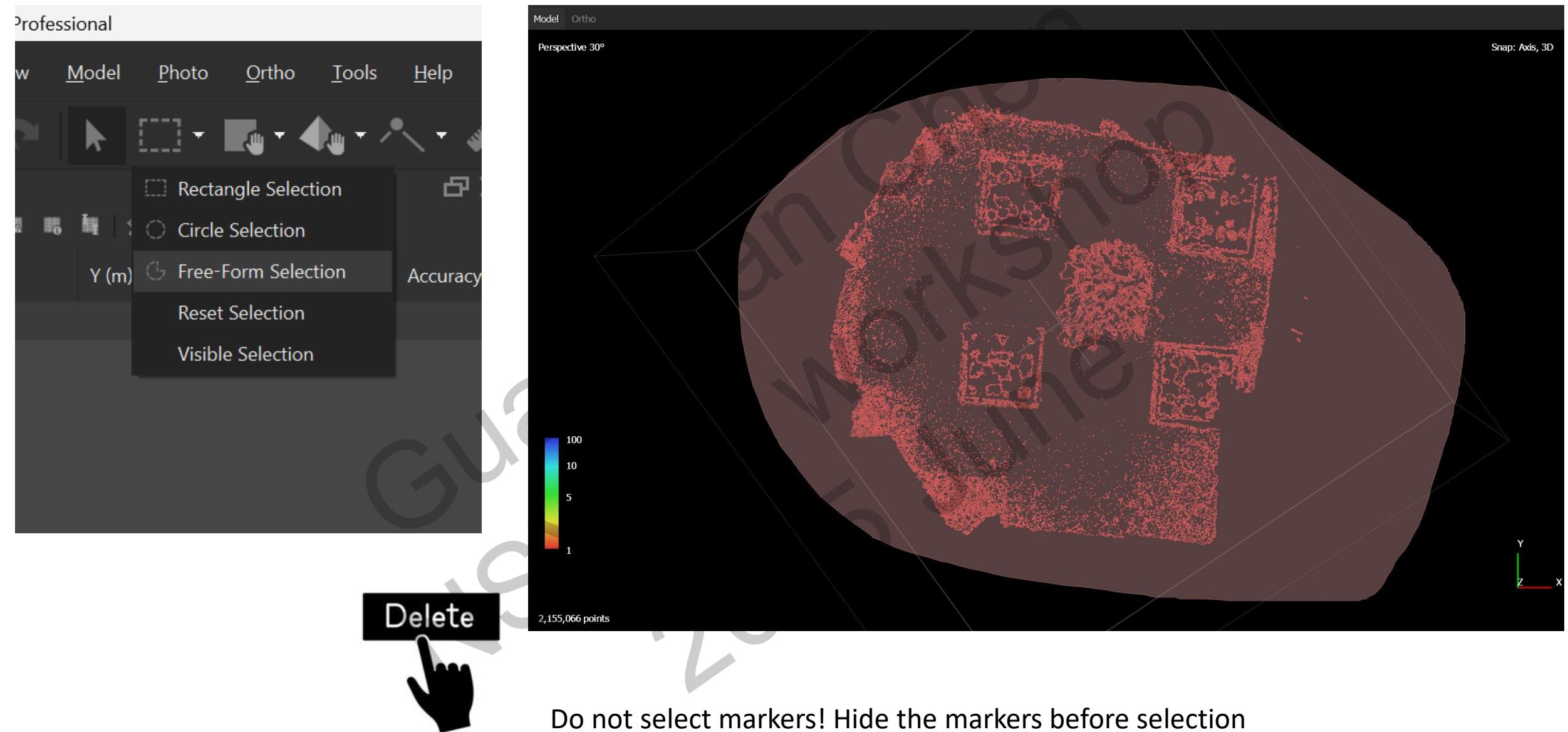


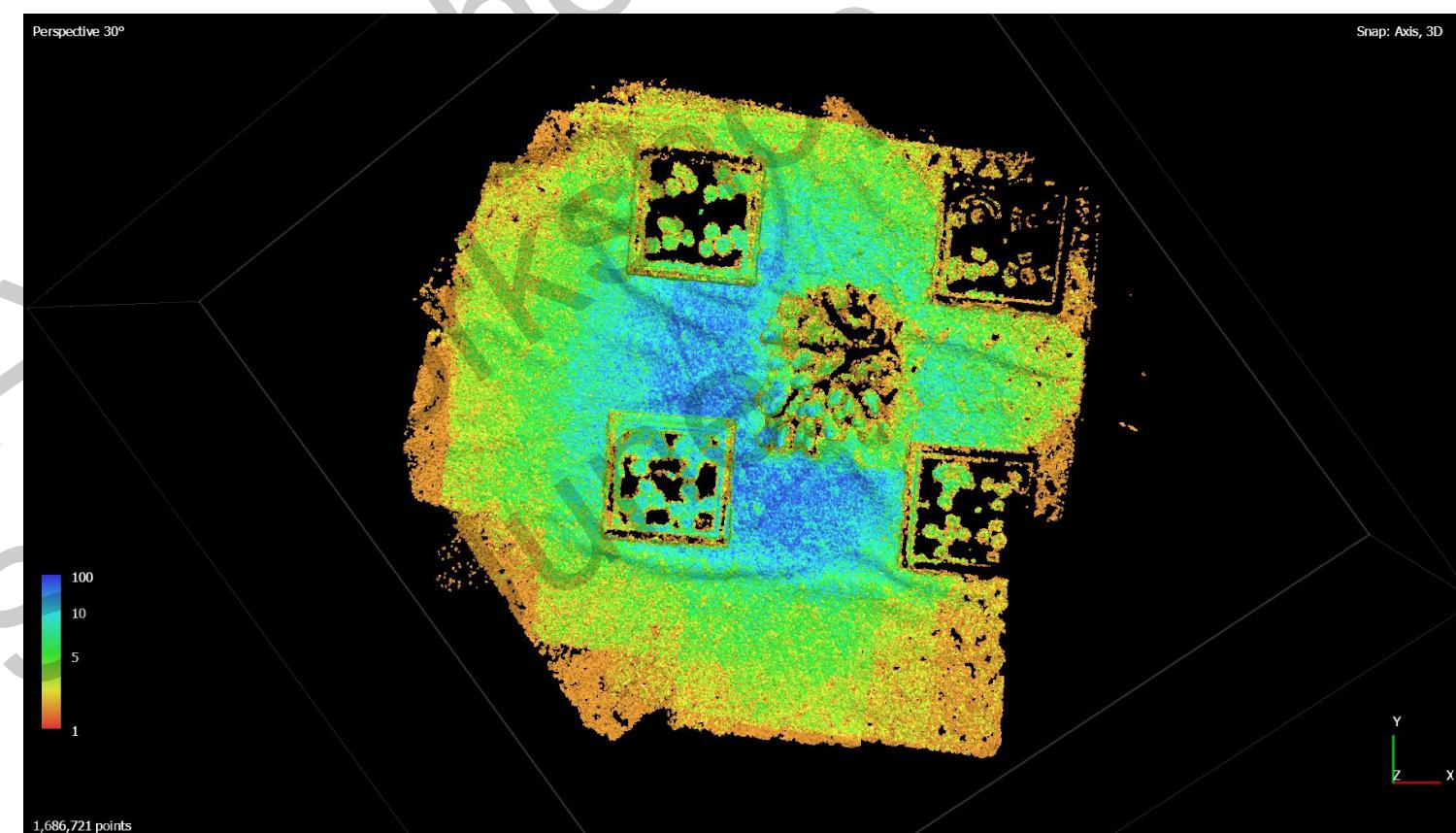
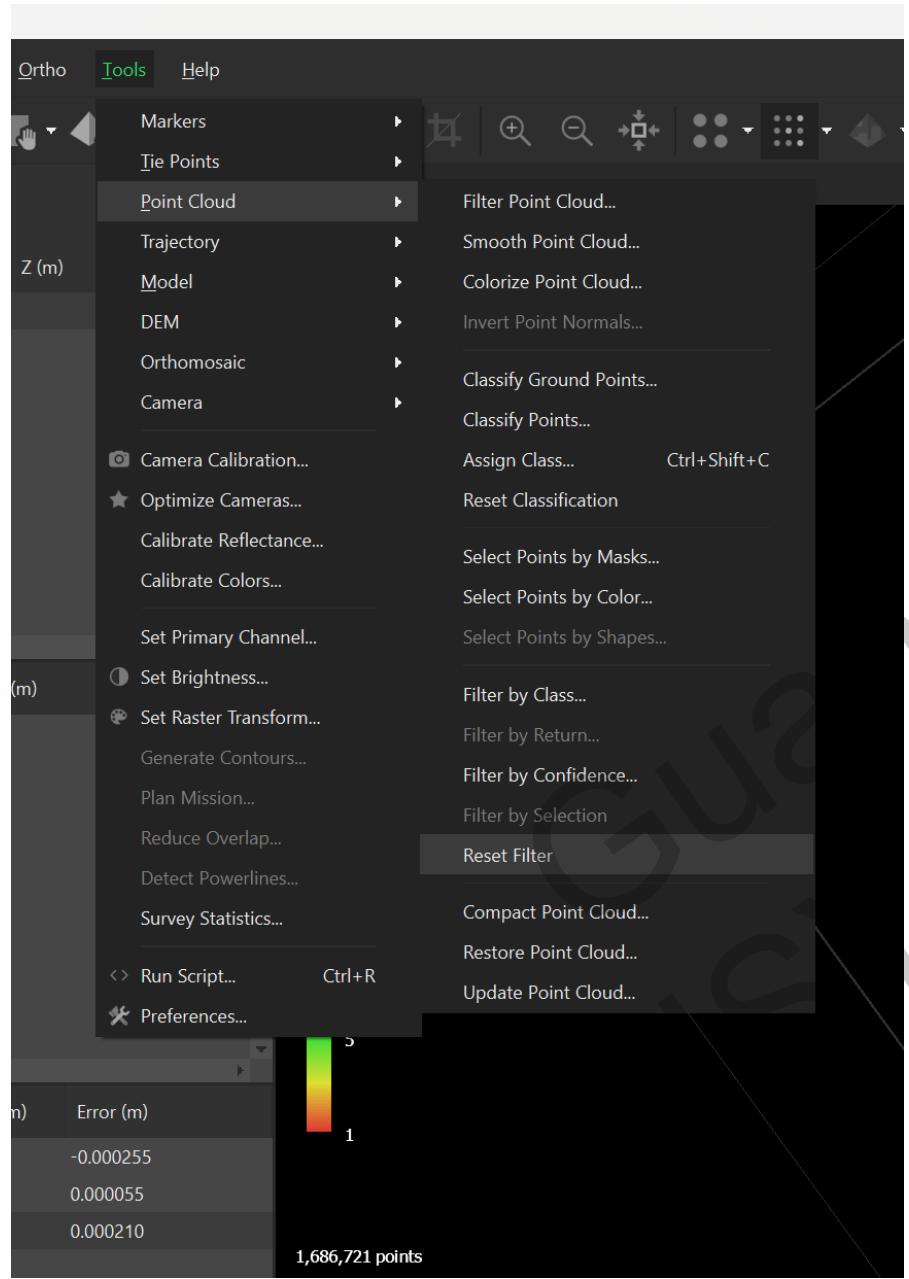


After Build Mesh can export
depth map

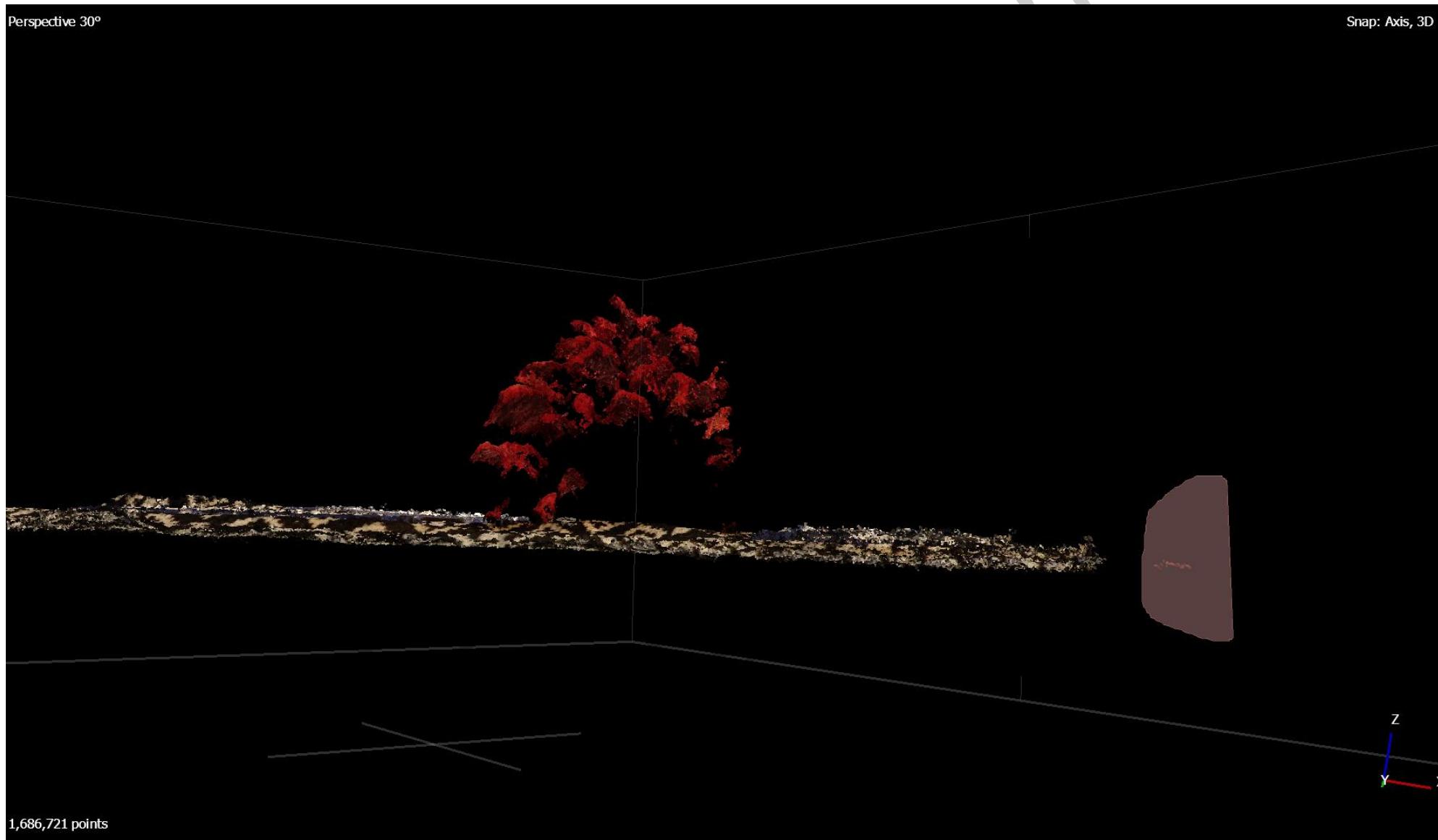




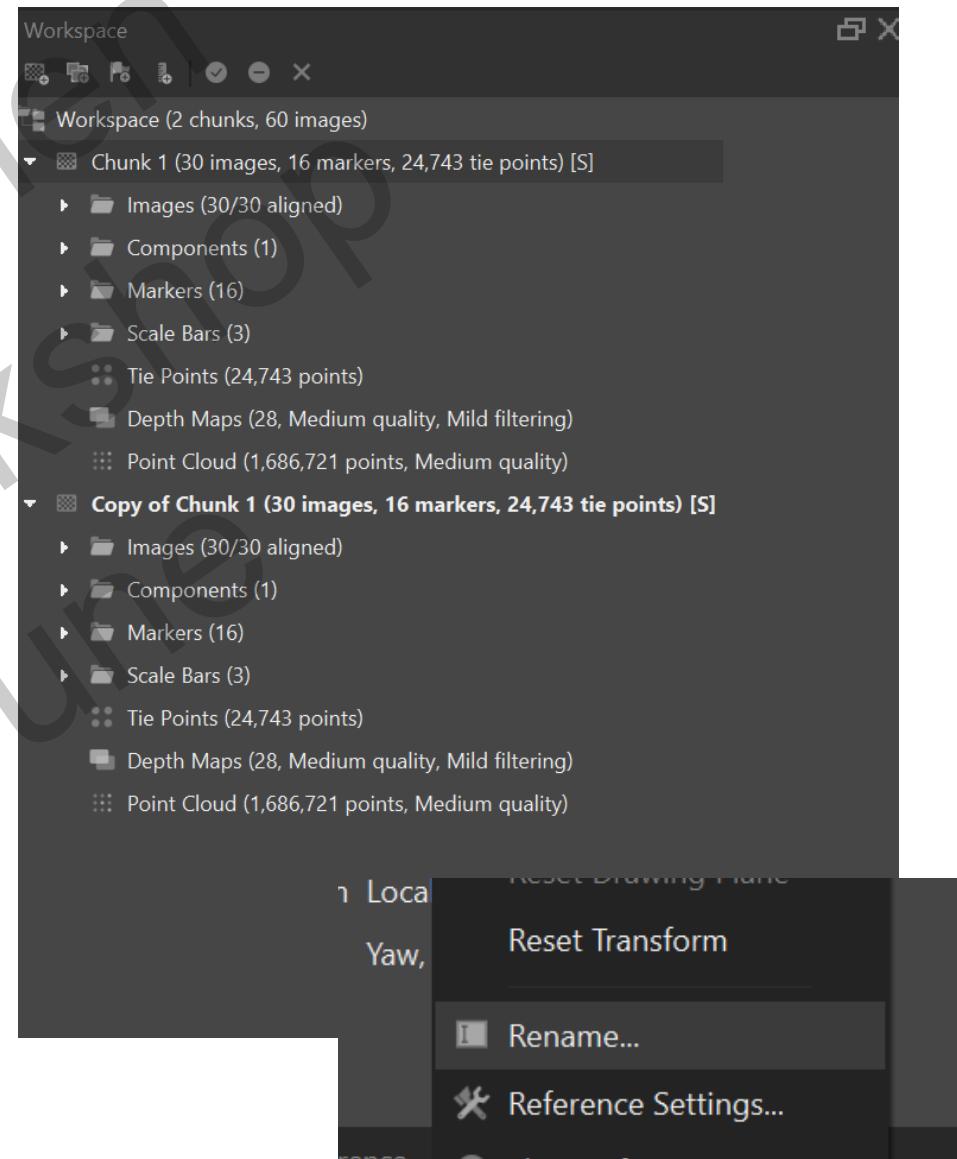
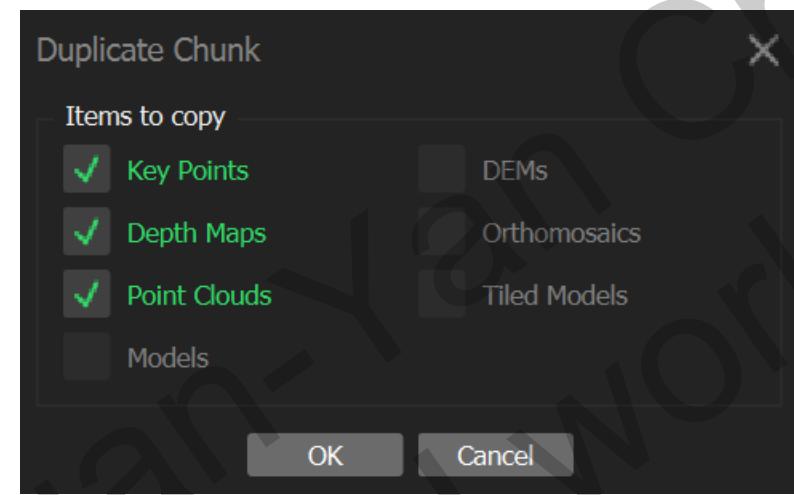
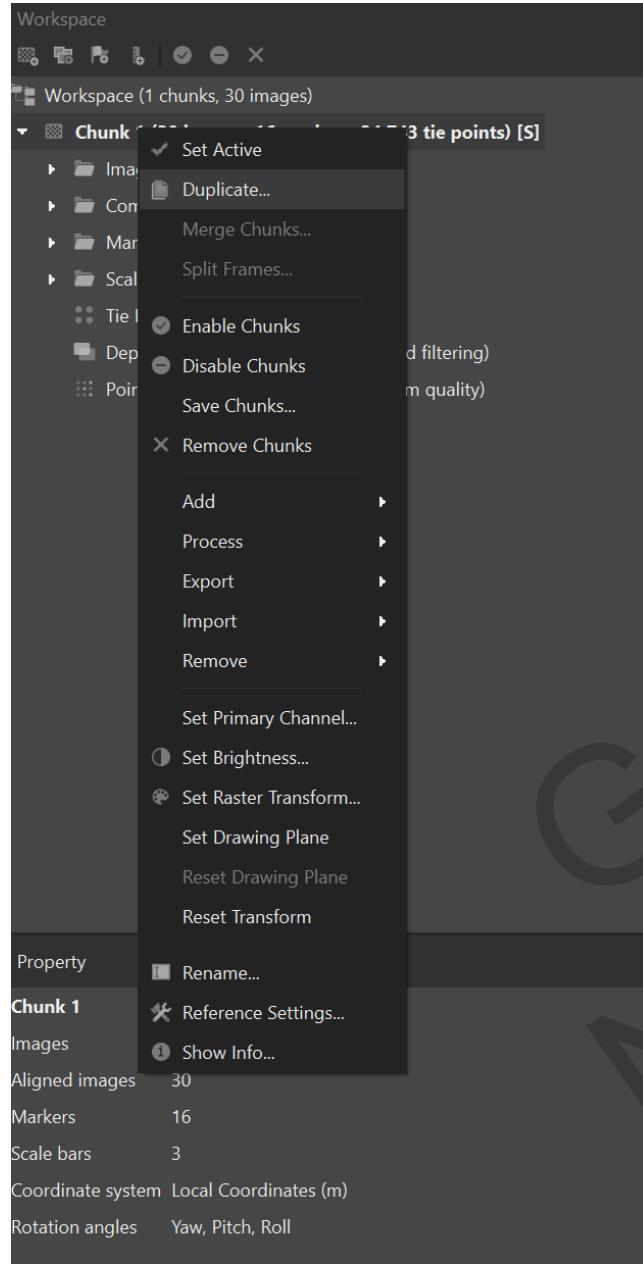




Clean the outliers



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



sional

Model Photo Ortho Tools Help

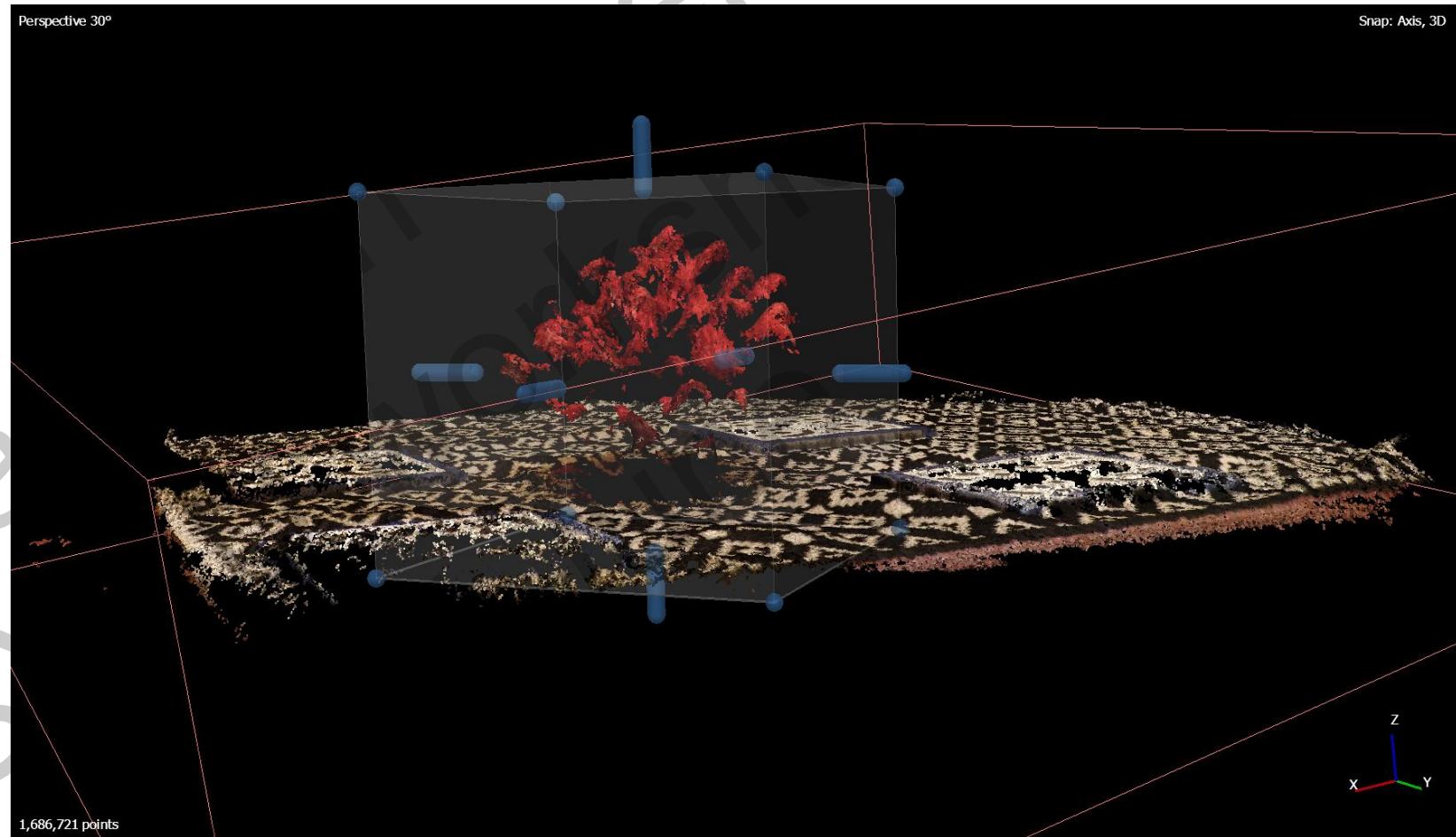


- Move Region
- Resize Region
- Rotate Region
- Rotate Region to View
- Rotate Region to Local Frame
- Reset Region

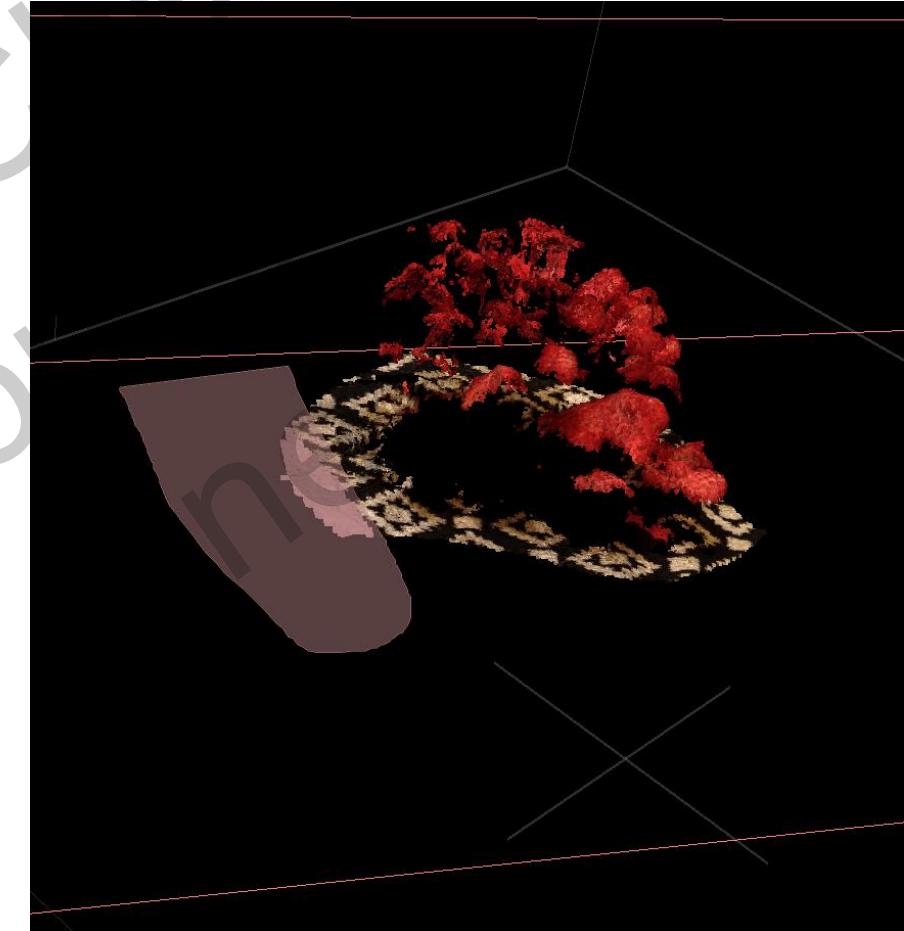
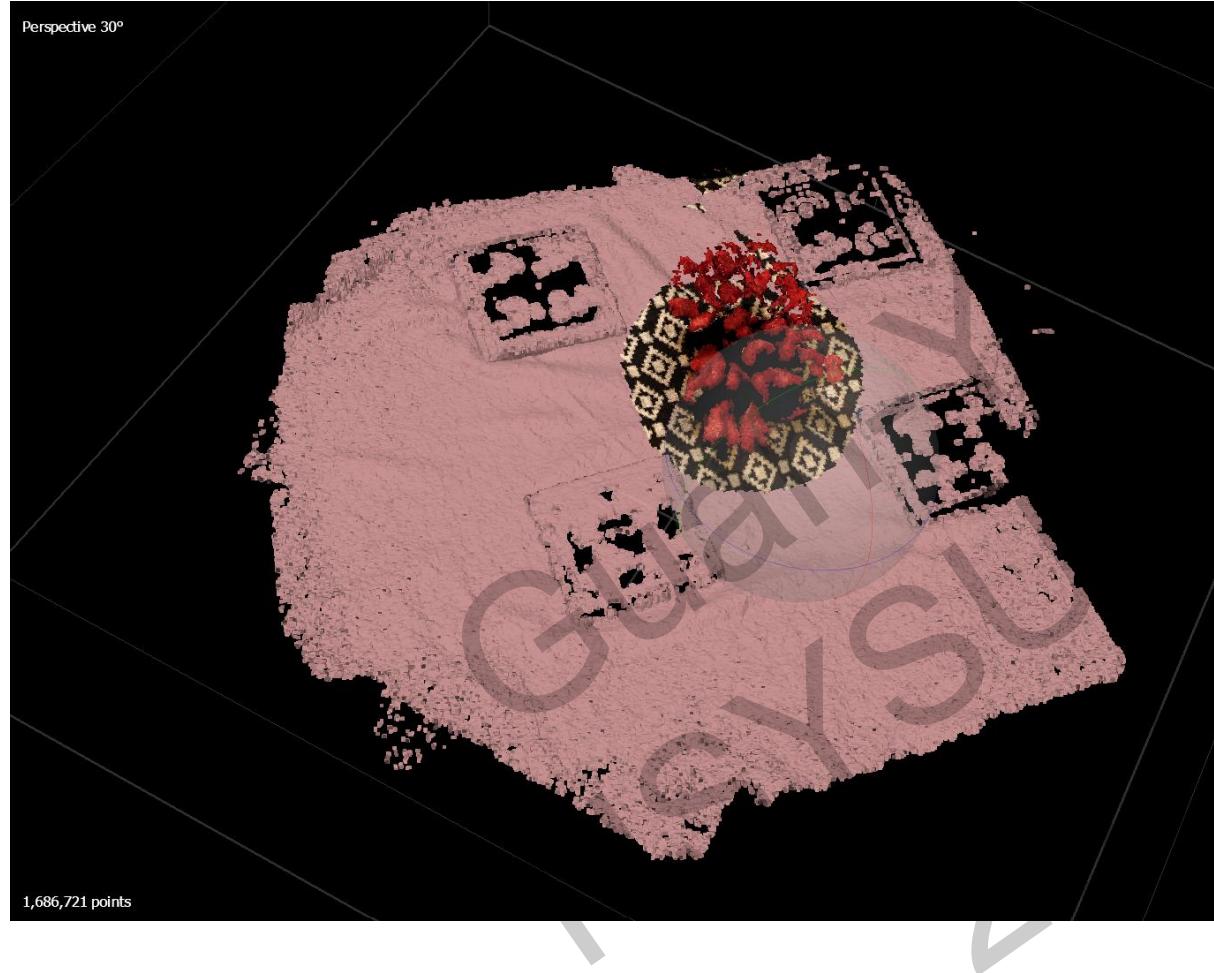
4,743 tie points [

Mild filtering)

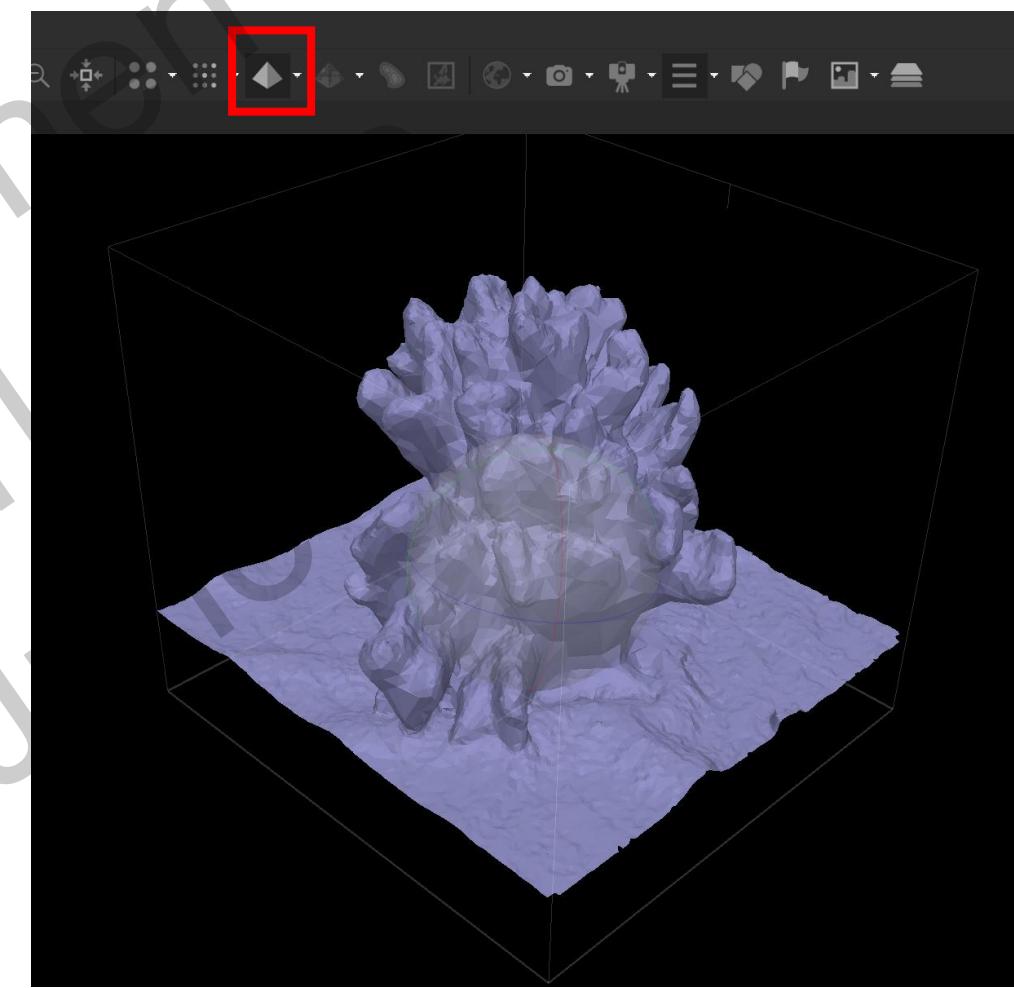
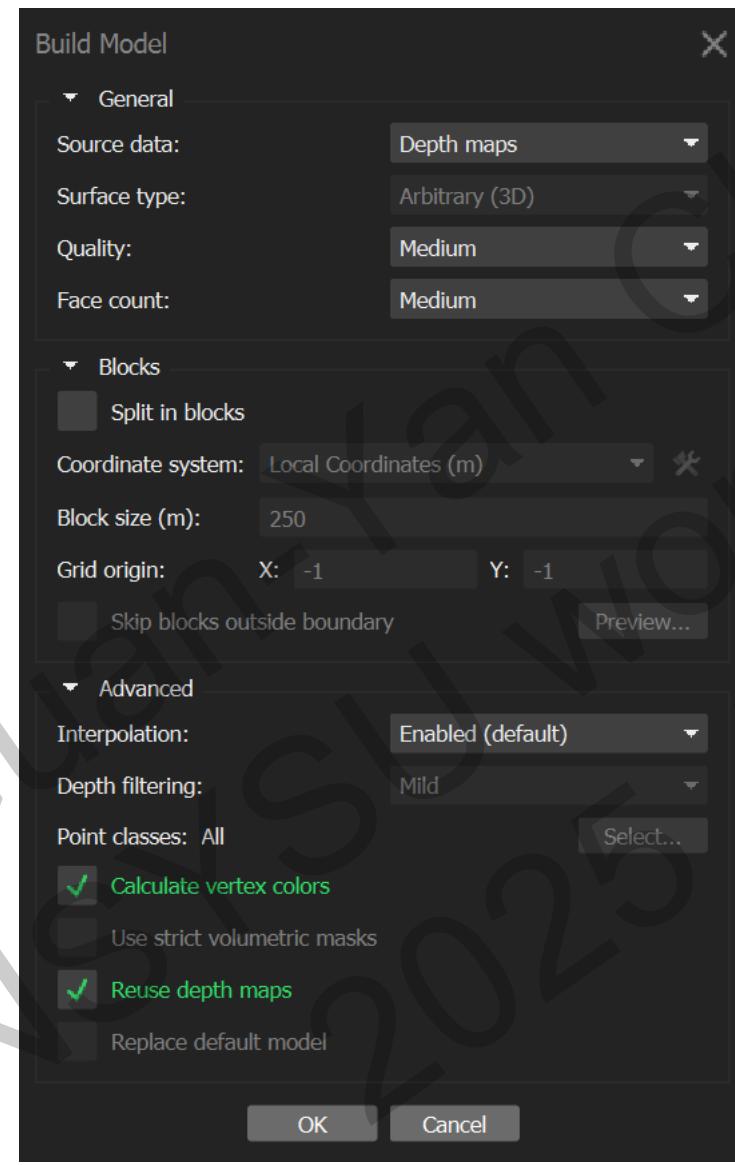
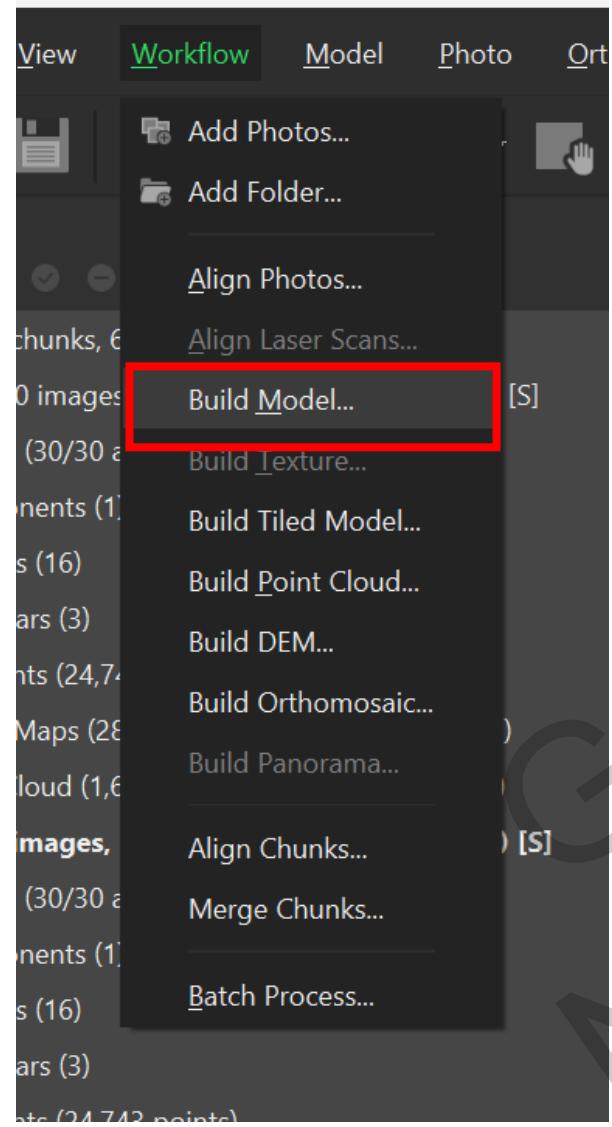
Medium quality)



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...

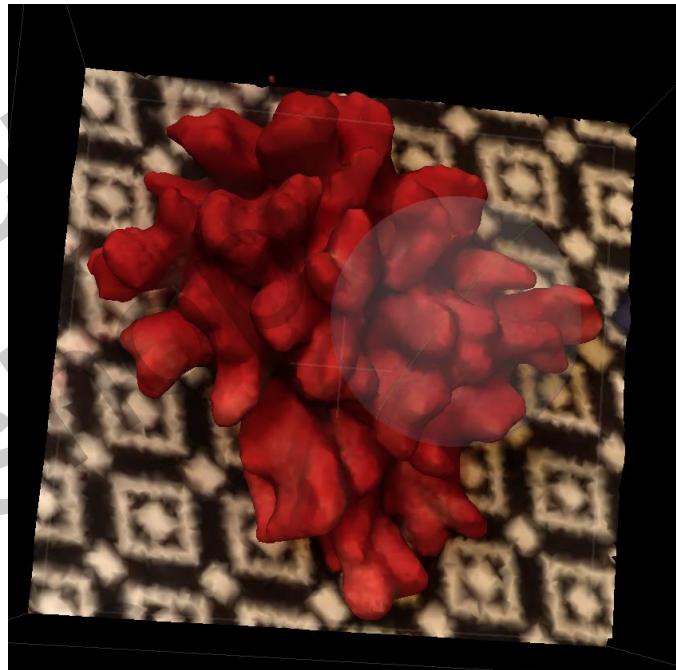
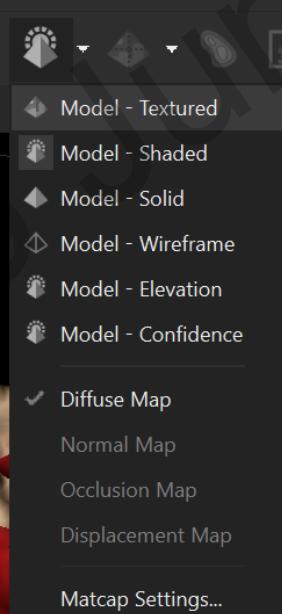
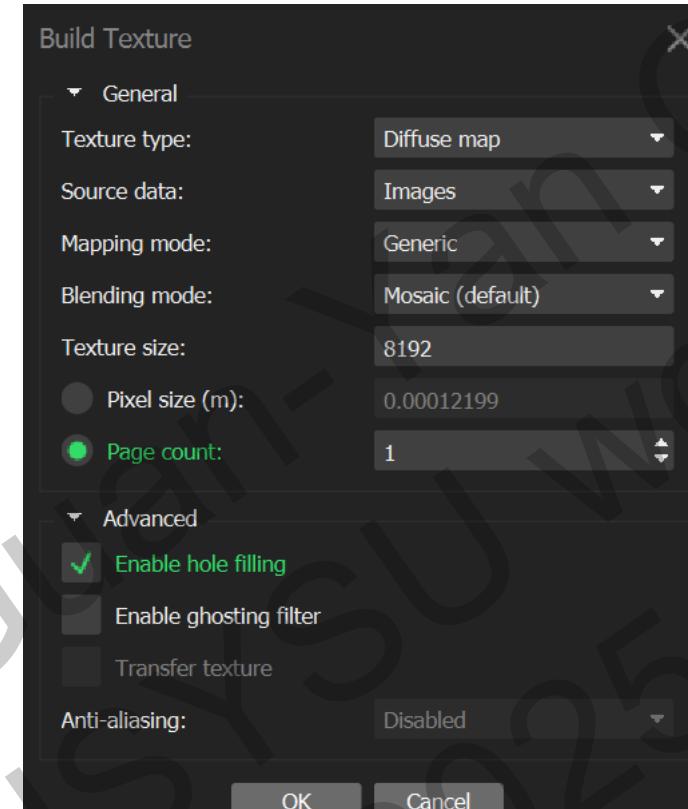
Build Panorama...

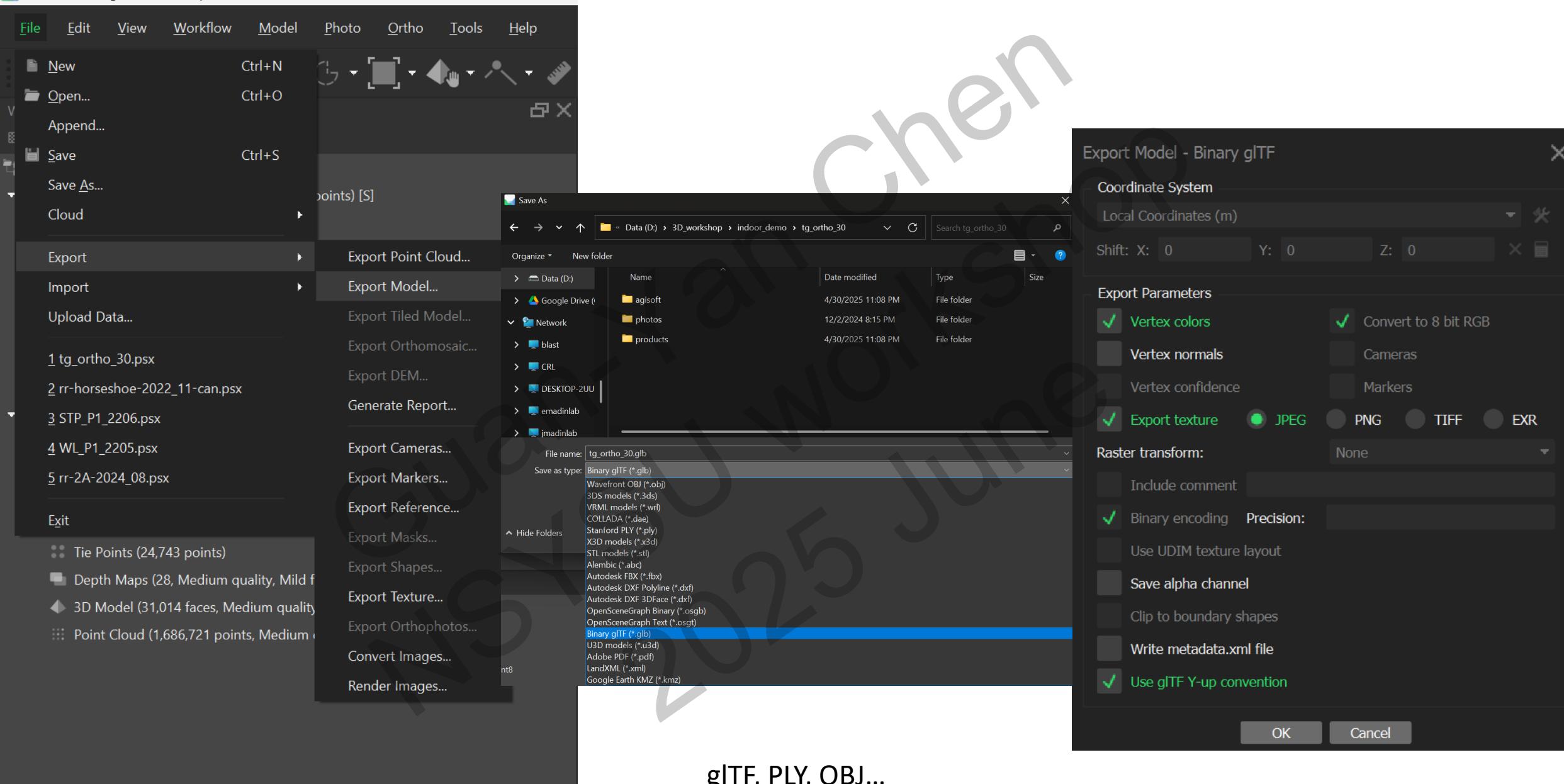
Align Chunks...

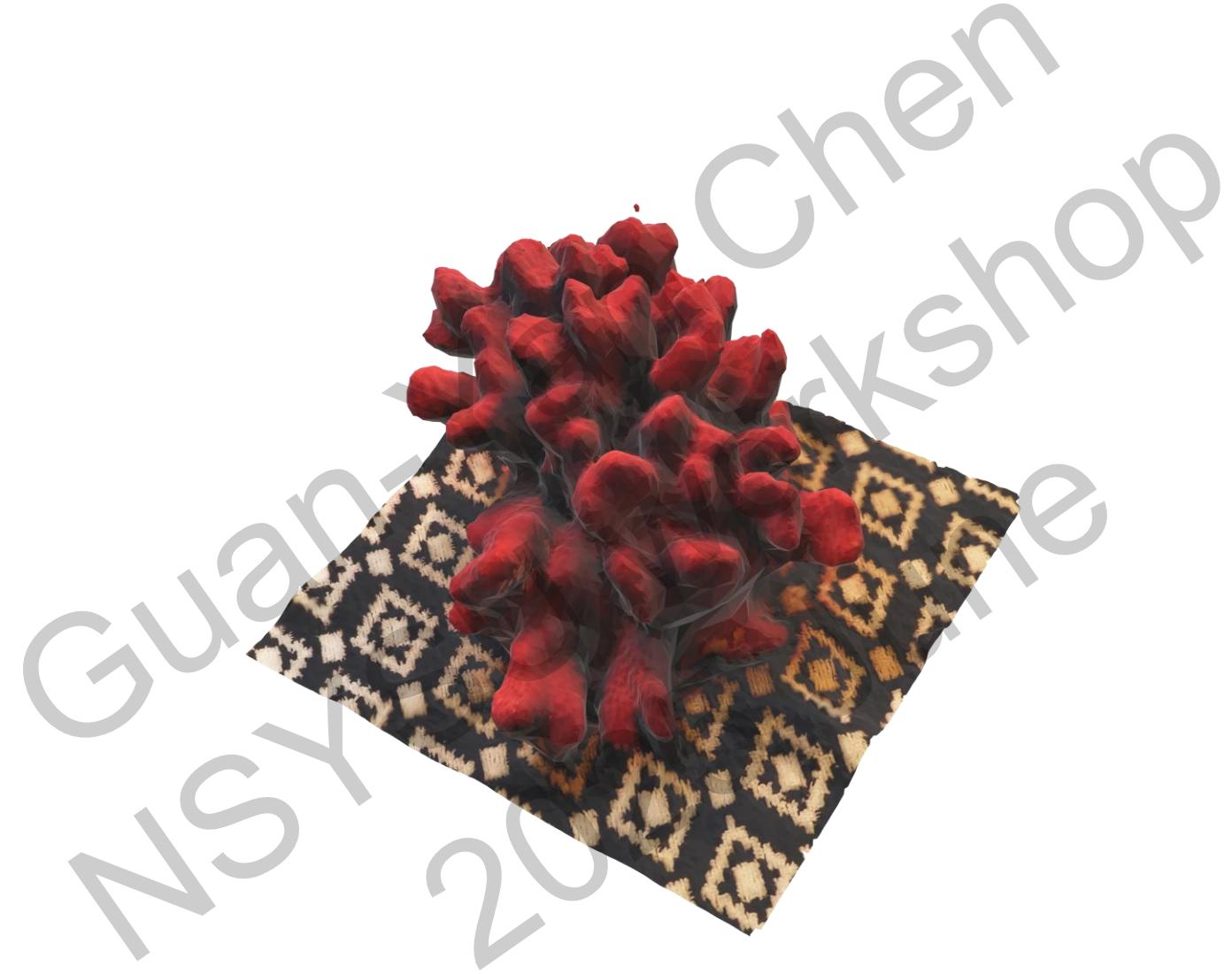
Merge Chunks...

Batch Process...

3 tie points) [









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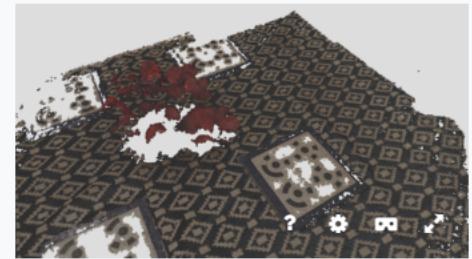
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We support **FBX, OBJ, DAE, BLEND, STL**, and **many others**.

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CANCEL

Edit model



UPLOAD
PROCESSED
READY TO PUBLISH

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

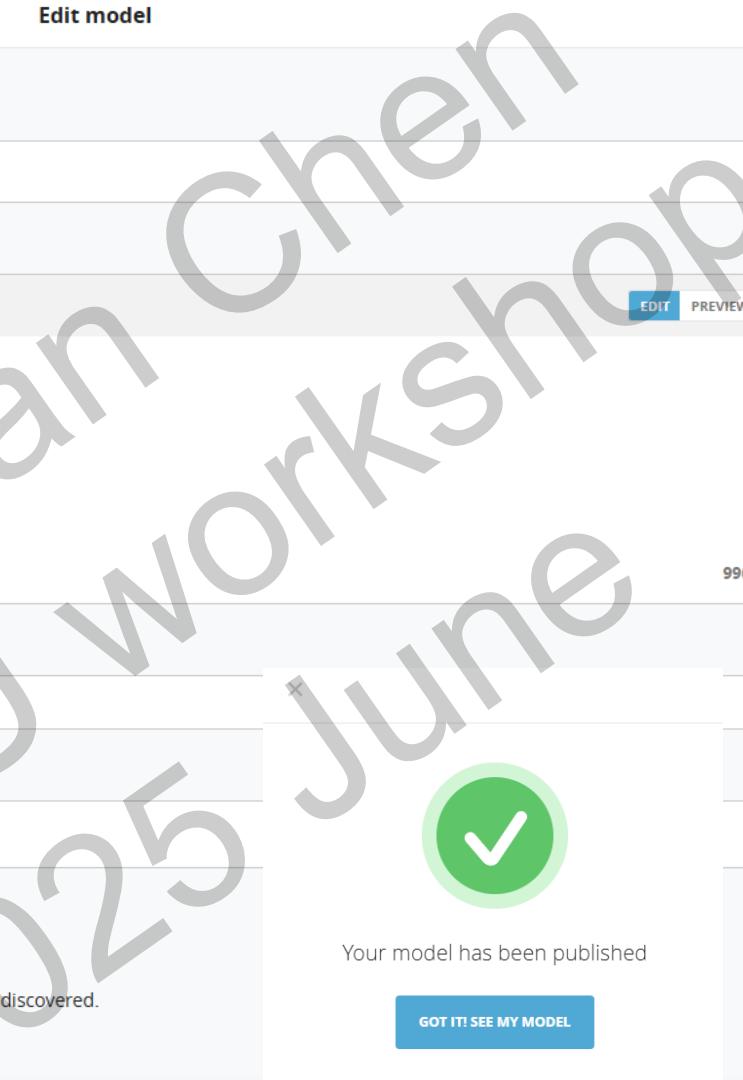
Suggested tags: noai, createdwithtai, biology, sponge, marinelife, keelung, iontu

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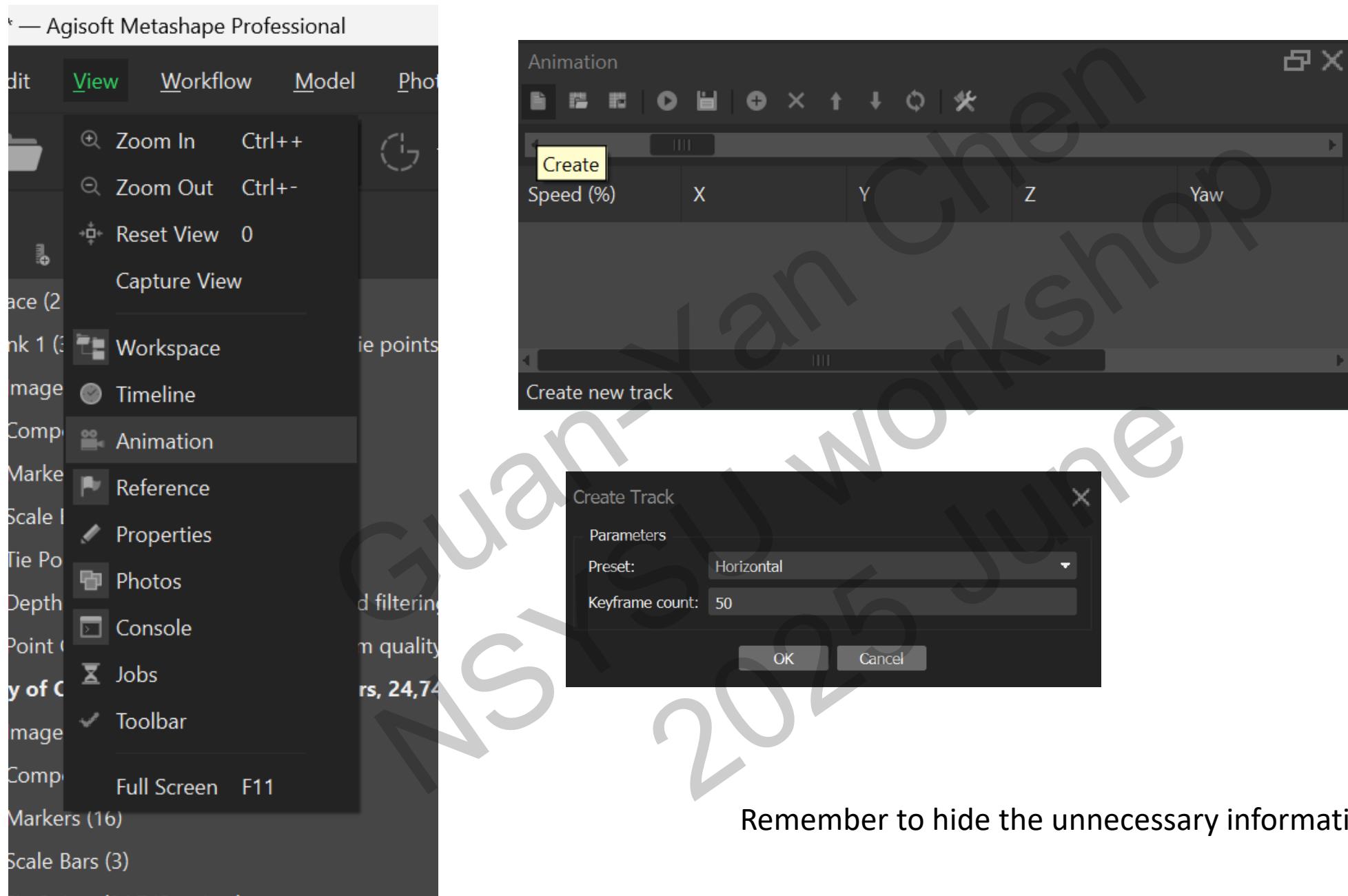
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