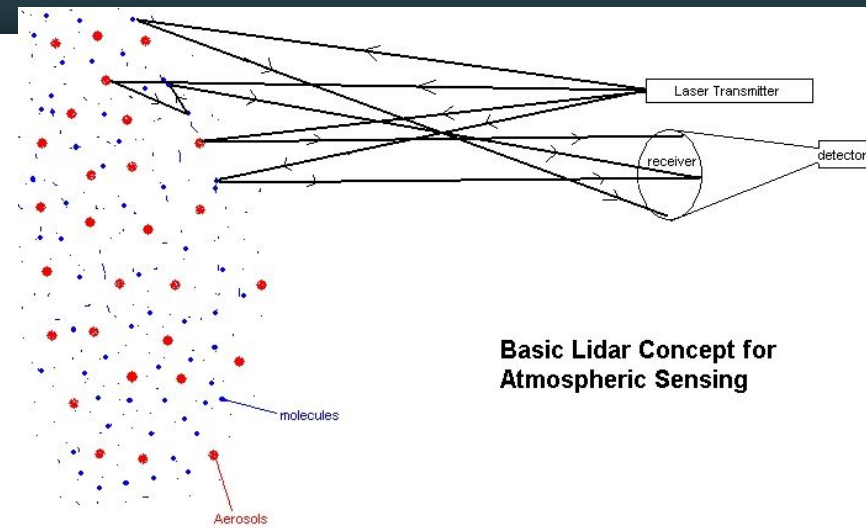


LiDAR

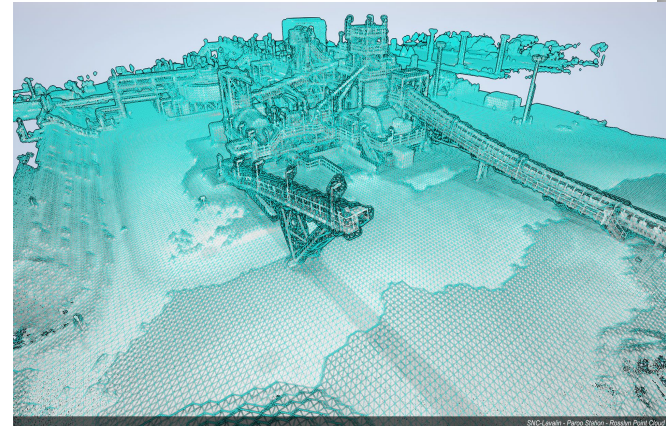
Getting Started with
Point Cloud Data in UE4

What is LiDAR

- Light Detection and Ranging
- Similar to Radar
- Uses light detection to create 3D points.
- A collection of these points are known as a “point cloud”



Basic Lidar Concept for Atmospheric Sensing

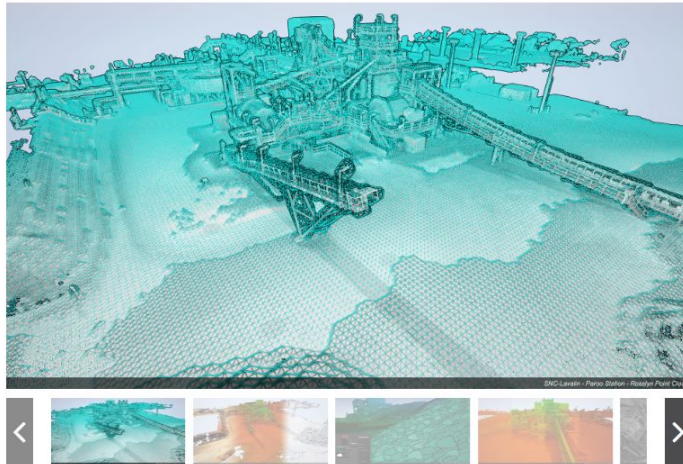


What is a point cloud

Point clouds are large data sets composed of 3D point data. Aerial LiDAR (Light Detection And Ranging) laser scanners are the most common instruments used to collect geographic point cloud data. Geographic LiDAR data is most commonly available in LAS (LiDAR Aerial Survey) or ASCII (.xyz) format.

How to create them quickly for use in UE4

Epic Games has provided a Free plugin for the Unreal Engine that allows their users to import and manipulate LiDAR Point Cloud data into their engine. Once downloaded, you will want to go into the Plugins window of your project and enable the plugin. This will require a restart of the project.



LiDAR Point Cloud

Epic Games · Dec 10, 2019

★★★★★ ~ 20 20 reviews written | 9 of 21 questions answered

Import, visualize and process point clouds acquired from laser scanning devices.

Download

OR

Write a Review

Supported Platforms

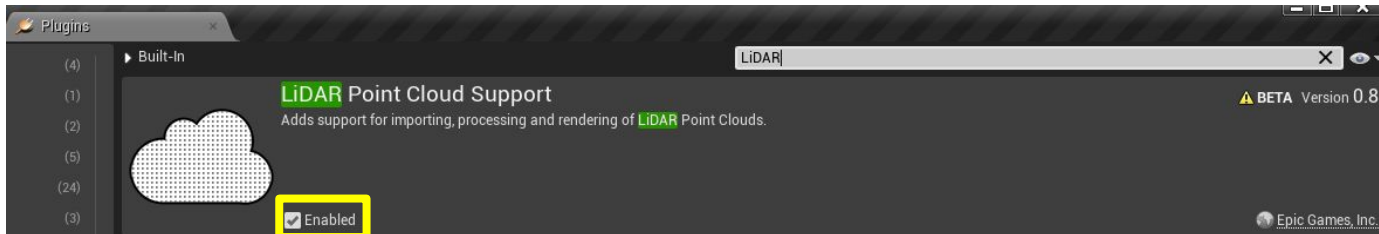


Supported Engine Versions

4.24

Download Type

Engine Plugin



Required Equipment / Software

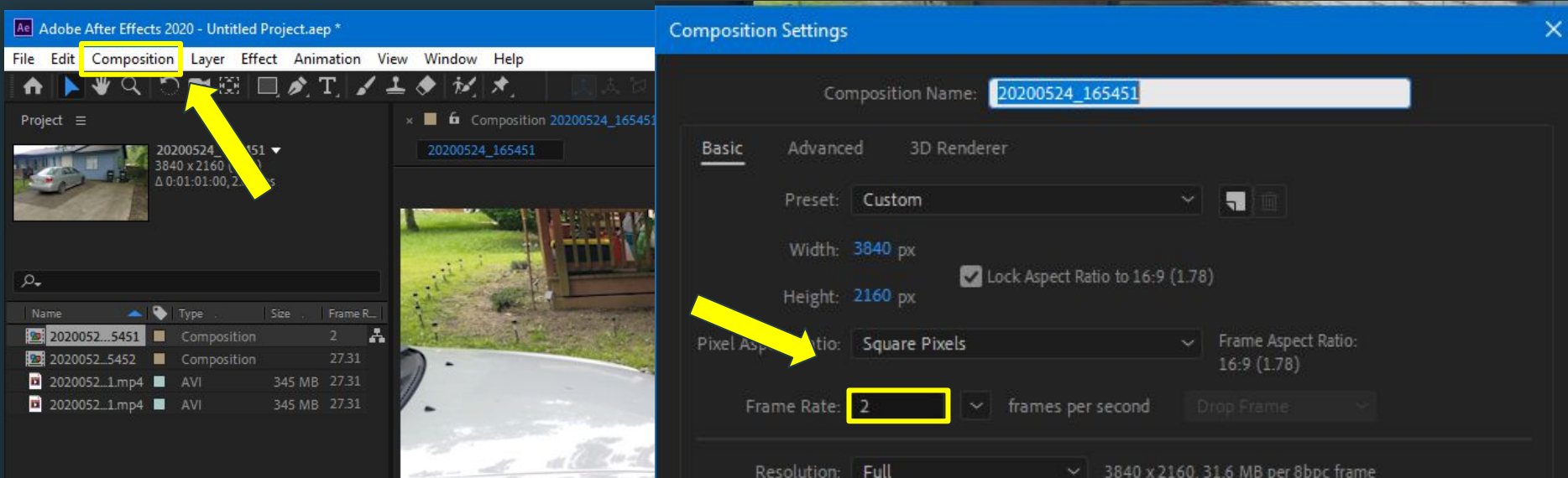
- Video Camera (cell phone will do)
- Video editing software (we'll need to export the video into an image sequence. While you can do this in UE4, I recommend a program like Premiere or After Effects)
- Agisoft Metashape ([link](#))
- And of course....
 - Unreal Engine 4

Collect Sample Video

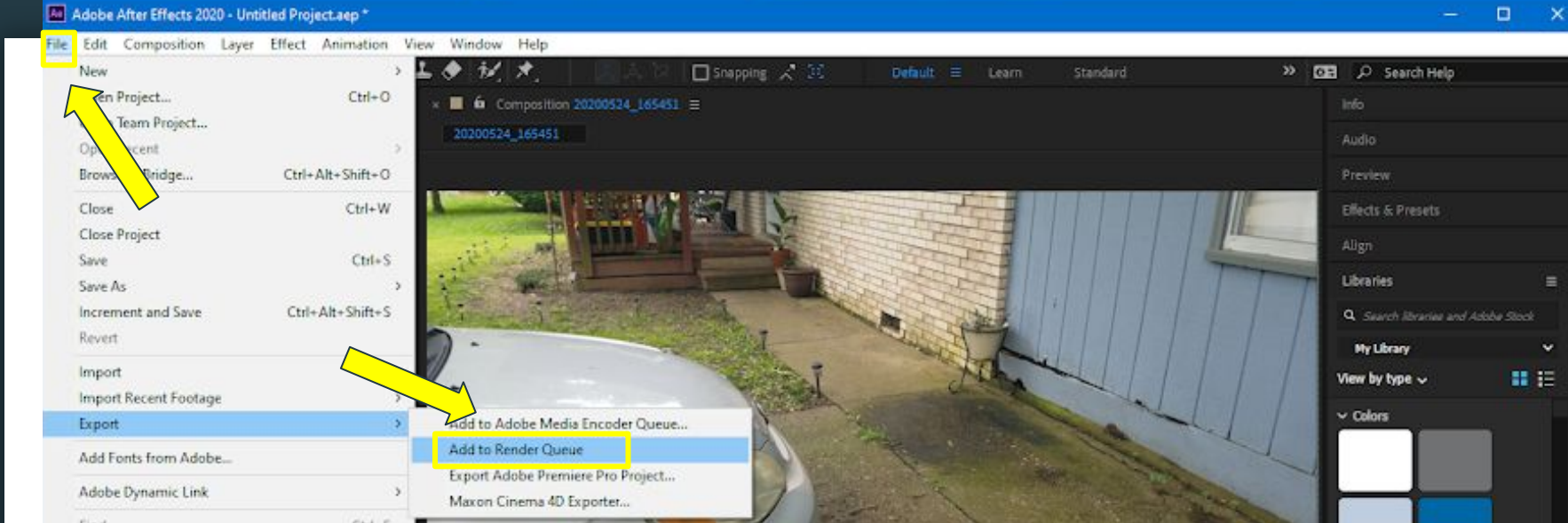
- The higher the resolution the better
 - Recommended 4k
- Record while slowly around targets and capturing all the angles



In this example we'll be using
Adobe After Effects
to prep our video

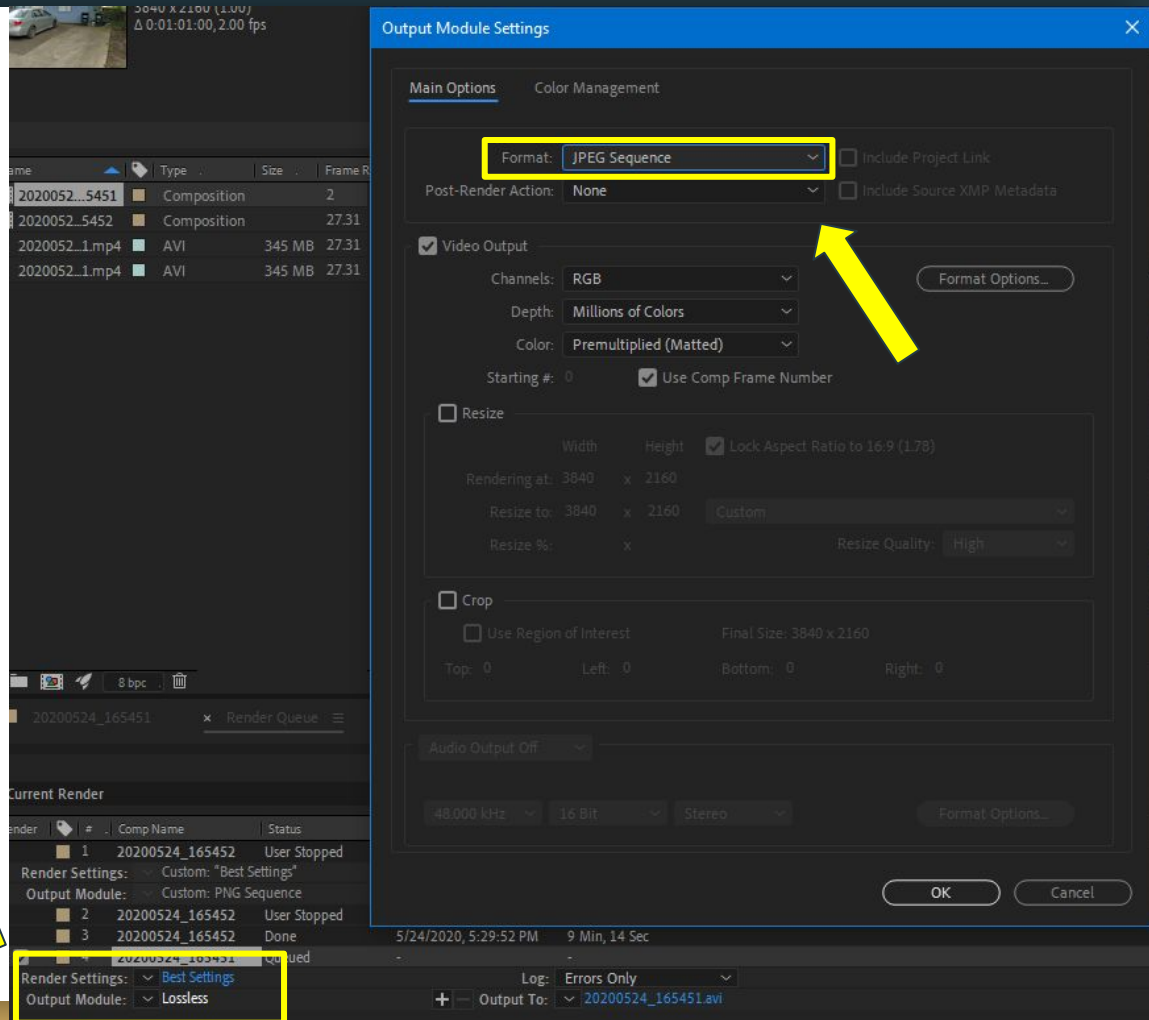


First change the desired frame rate down to about “2”. This will significantly decrease the amount of time it takes to generate the point cloud and will provide enough smooth data to get a result we are happy with.




Next, under the “File” tab in the toolbar, select Export > Add to Render Queue.

Next we'll need to change the Output Module Settings to export into either a PNG sequence or a JPEG Sequence.



Render out the sequence.

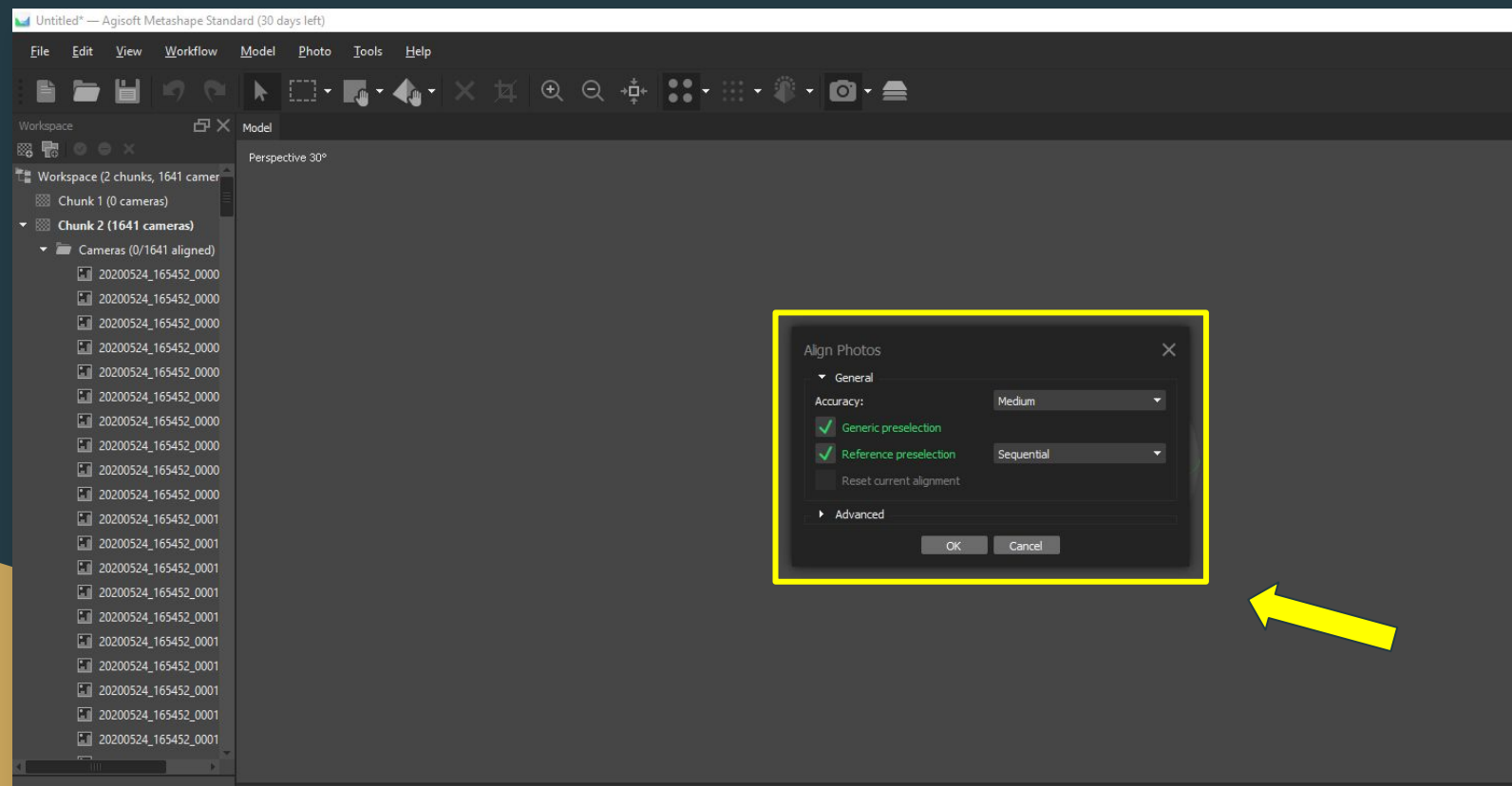
This part may take a while depending on the size of the video.



20200524_165451 x Render Queue

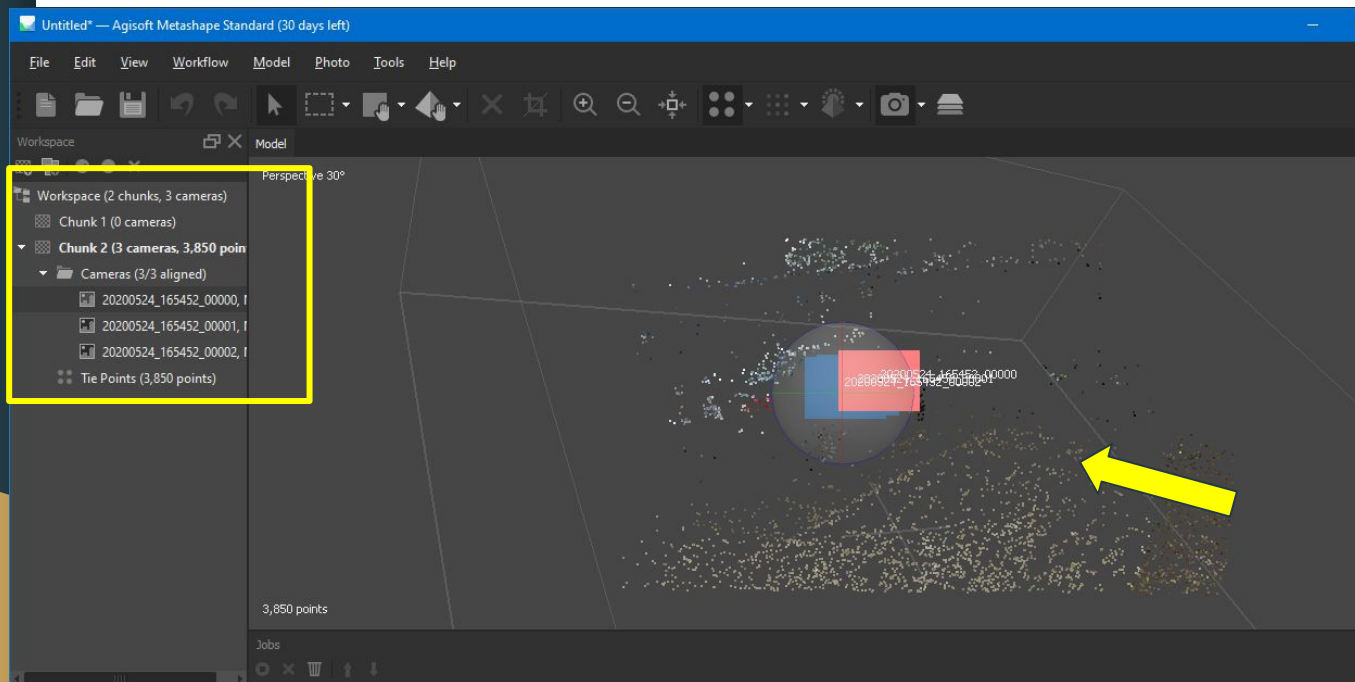
Current Render Elapsed: Est. Remain: Queue in AME Stop Pause **Render**

Render	#	Comp Name	Status	Started	Render Time	Comment
>	1	20200524_165452	User Stopped	5/24/2020, 5:09:18 PM	14 Min, 54 Sec	
>	Render Settings: Custom: "Best Settings" Log: Errors Only					
>	Output Module: Custom: PNG Sequence + - Output To: 20200524_165452_####.png					
>	2	20200524_165452	User Stopped	5/24/2020, 5:26:45 PM	49 Seconds	
>	3	20200524_165452	Done	5/24/2020, 5:29:52 PM	9 Min, 14 Sec	
>	4	20200524_165451	Queued	-	-	
>	Render Settings: Best Settings Log: Errors Only					
>	Output Module: Custom: JPEG Sequence + - Output To: 20200524_165451\20200524_165451_####.jpg					

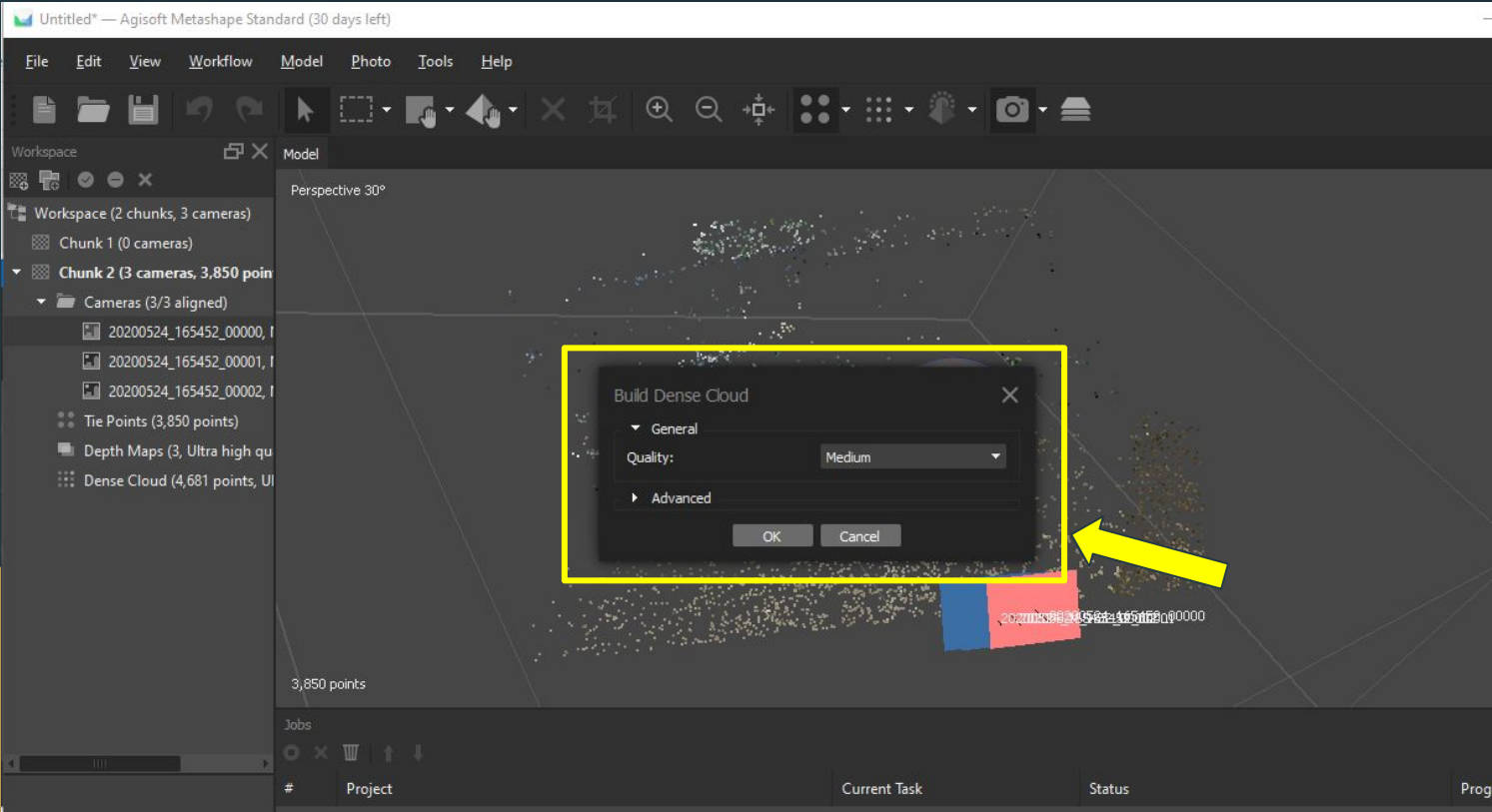


Once it's finished, upload those photos into Agisoft, click on
Workflow > Align Photos

The following window will pop up and you'll probably want to set
your settings to medium and Sequential if they aren't already.



This will essentially turn each photo in reference to the last and create the depth and color of each point in the point cloud. For this example I chose only three photos to save on time. The higher the settings from the previous slide will create more points but also increase your render times.



Next we want to select Workflow > Build Dense Cloud
This will, well, make the point cloud more dense. It will also do a better job at getting a more accurate depth from the cameras.

At this point you are able to export the point clouds for Unreal Engine.
File > Export..

Using the LiDAR plugin you are able import the point cloud data as either .las or .txt files

Under Workflow, you can also generate a model from the point clouds.
This model will likely be noisy and high poly but could be cleaned up using other programs.

Photo



Generated Model



Once the point cloud data is inside of Unreal Engine you can add collision, remove points, merge with other point clouds and much more. We'll be using point cloud data extensively while recording historical sites and construction projects for Remake West Virginia.

Thank you!

Don't forget to share what you make with us :)

