## **Geo-referencing in IMAlign:**

- 1. After you have aligned all your files save the IMAlign project.
- 2. Remember to run a Best-Fit Alignment and Comparison by going to this button to perform a global alignment. This will allow you to get a closer alignment since all the scans will try to move into a precise position compared to all the other scans.
- 3. Once you are satisfied that the alignment of the scans, create the scanner position so that you can start geo-referencing the file. These scanner positions correspond to GPS coordinates you recorded from the tripod during scanning. To do so follow the steps below:

File View Select Edit	Image Align Config Window	Plug-ins Help
ImAlign         G           ImAlign         Imalign           Image: State of the state of th	Reduce Overlap Interpolate Remesh Invert Orientation Lock Ctrl+Shift+L Unlock Ctrl+Shift+F	
■	Ungroup Z Min	
🕲 Global Refere	Points Reference Points	Anchor     Create Numerically     Create from Bounding Box
		Create from Digitizer Position Edit Numerically

## Step 1

Image  $\rightarrow$  Reference Points  $\rightarrow$  Create from Digitizer Position

## Step 2

A dialogue box will appear like the one below and press OK to continue.

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Value: 0.5	500000	
	1.1	
)ffset along vector		
ж 0.000000 у: 0.0	000000 z	1.000000
	E	· · · · · -
Along predefined:	X	Y Z
Offset by: 0.00000	0	

You will see that the scanner position of the ILRIS-3D unit will be shown as seen below.



4. After creating the scanner positions you now have to "Set the Huge Translation" by using one of your recorded GPS coordinates as seen below. This brings the ILRIS-3D scan into the GPS coordinates system so that the program can georeferenced the aligned scans correctly.

Step 1		
🛸 PolyWorks/IMAlign - Un	titled ( C:\Documents and S	Settings\judith
File View Select Edit Image	Align Config Window Plug-ins	Help
D ≌ ■ 器   G ○ ७   ● ♀ ⊃   I	Best-fit Alignment & Comparison. Start Best-fit Alignment Stop Best-fit Alignment	 Ctrl+F2 Ctrl+F3
	Manual Alignment Auto-Match Reference Points View Auto-Match Report	Chilline
	N Point Pairs	Ctrl+F5 Ctrl+F6
	Next Ignored Image	
	Set Huge Translation	
	Image Matrix	۲

Align  $\rightarrow$  Set Huge Translation

## Step 2

File  $\rightarrow$  Open Point Cloud

庵 Huge Transl	ation	? ×
File		
Open Point Clo	udaa a	
Close	00	
Translation z:	0.000000	
Apply		Close



À Load Poin	t Cloud		<u>? ×</u>
Look in: 🔂	) GPS	- <del>•</del>	
142_Grou	ndTruth.txt		
File name:	142_GroundTruth.txt		Open
Files of type:	Point Cloud Files (*.*)	•	Cancel
Template:	Names + Points	•	Advanced
			Contraction of the second se

Depending on your ground truth GPS file structure you choose either Global Reference Points or in the case above Names + Points.

5. Now load in all your recorded GPS coordinates by going to File → Import Reference Points → Global Reference Points as seen below.



	obal Reference Points		?
Look in: [ 🚞	) GPS 📃	+ 🔁	I 🕂 🎹 -
🗒 142_Grou	ndTruth.txt		
File name:	142_GroundTruth.txt		Open
File name: Files of type:	142_GroundTruth.txt All Files (*.*)	<b>_</b>	Open Cancel
File name: Files of type: Template:	142_GroundTruth.txt All Files (*.*) Names + Points	•	Open Cancel Advanced

As seen above the GPS ground truth file structure starts with the Names of the coordinate and then the X.Y,Z co-ordinates. So we choose Names + Points to keep the same files structure in the IMAlign project. If you do not know the file structure of the GPS points you can use Global Reference Points to import your GPS position.

After importing your GPS ground truth points you will see that both the scanner position and the GPS position are on the same window as seen below.



6. Now to geo-reference the scanned data, select all the images in the tree view, and then use the Align  $\rightarrow$  Auto-Match Reference Points command.



A dialogue box like the one below will appear next. Press OK to continue.

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Match reference p Global refere	points of selected imag nce points only nage reference points	jes to:
Tolerance:	0.500000	
ОК		Cancel

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Nb ma	itched points:	3	
Mean	deviation:	2e-7	

Simply choose the correct solution found by the auto-match Algorithm as seen above. 90% of the time, the first solution is the correct one.

7. To save the project, go to File  $\rightarrow$  Save Project As...

