

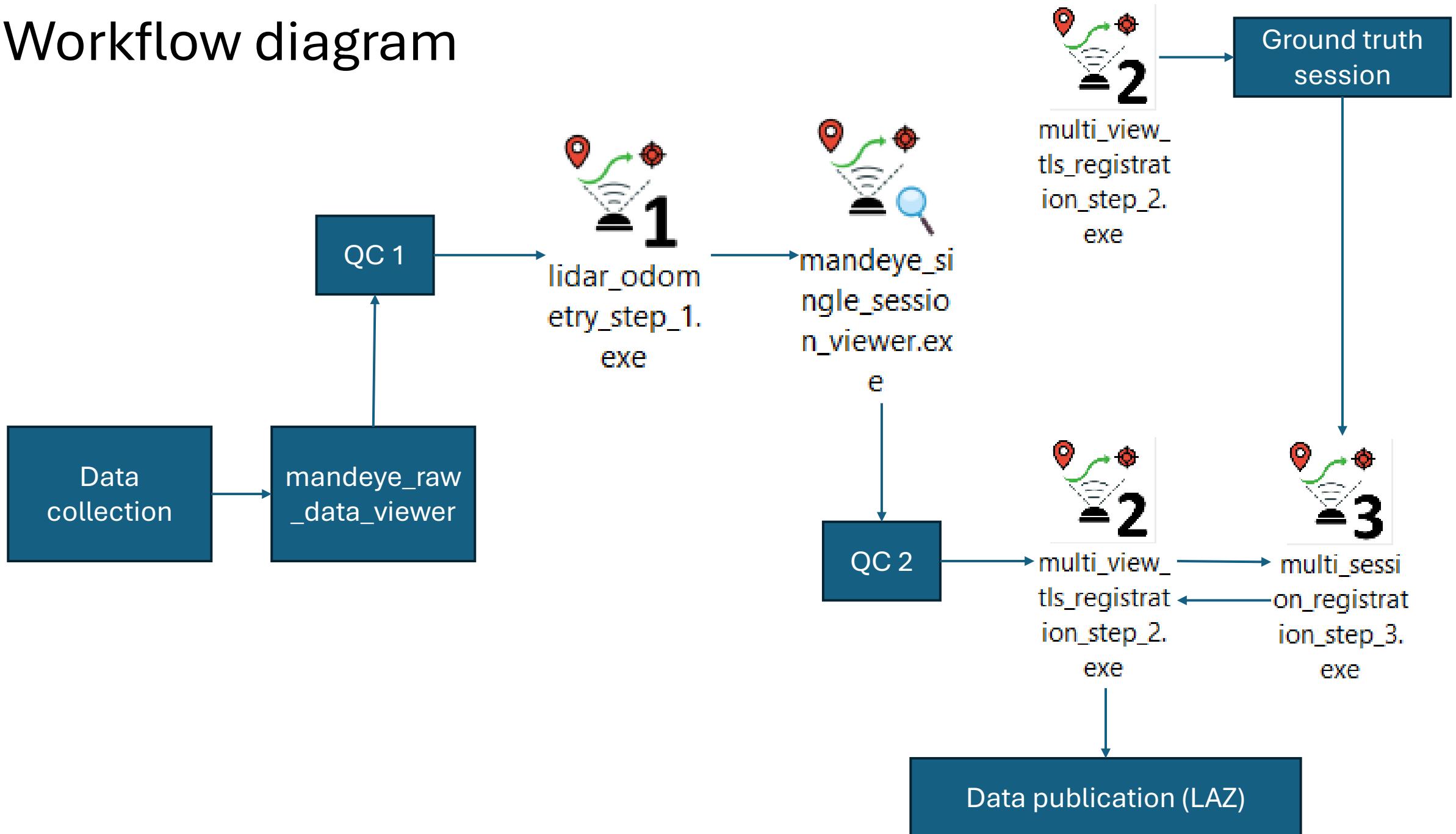
HDMapping v0.93

[MapsHD/HDMapping](#)

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Workflow diagram



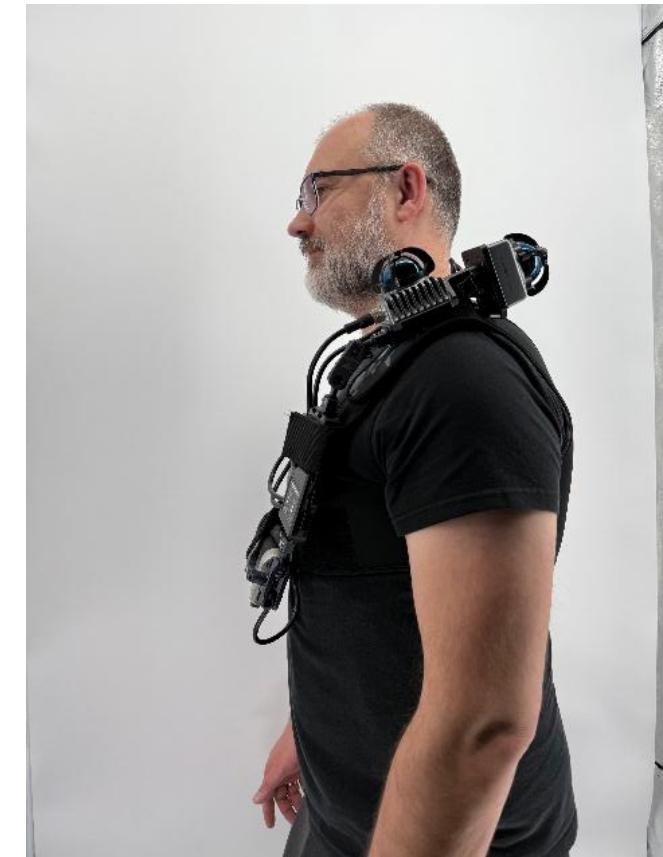


multi_session_registration_step_3.exe

Assumptions:

1. Project is composed of multiple sessions
2. Only one session in the project can be „ground truth”
3. multi_session_registration_step_3.exe performs pose graph slam
4. It is possible to add Edge for single session (similar to multi_view_tls_registration_step_2.exe)
5. It is possible to add Edge for two different sessions
6. „Ground truth” can not be changed (gizmo is disabled), only multi_view_tls_registration_step_2.exe can change „Ground truth” flag

Collect data with MANDEYE



Inspect data with



mandeye_si
ngle_sessio
n_viewer.ex
e

QC 1



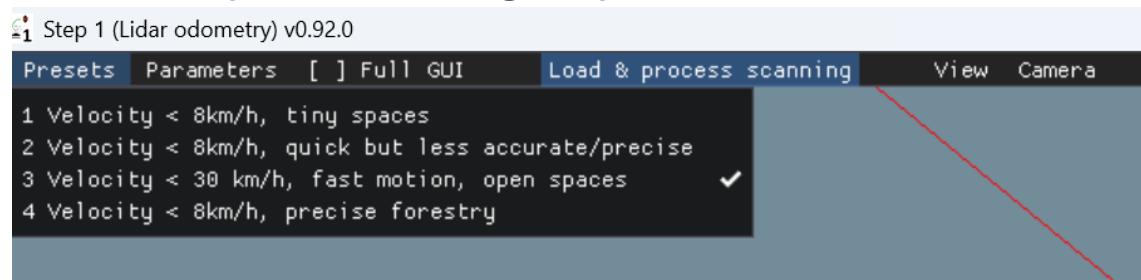
LiDAR inertial odometry

Software: lidar_odometry_step_1.exe

lidar_odom
etry_step_1.
exe

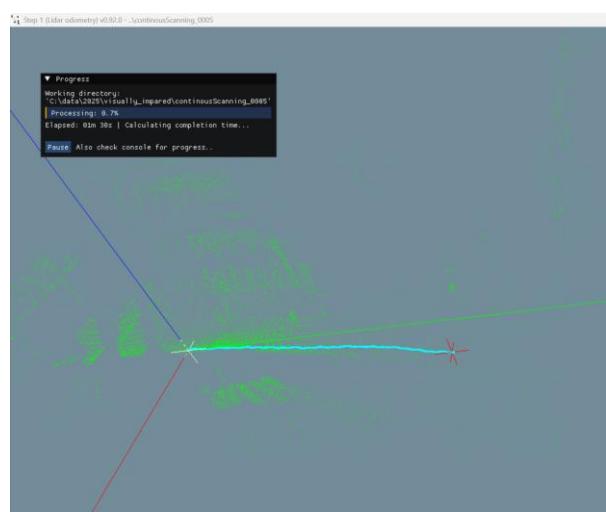
1. Choose one of Presets

- Velocity < 8km/h is dedicated for caves, tiny spaces, inside tiny rooms
- Velocity < 8km/h, quick but less accurate/precise is using less iterations in optimization
- Velocity < 30km/h, fast motion, open spaces removes points in 3m radius so it can not be used in tiny spaces
- Velocity < 8km/h, precise forestry is for making map in the forest



2. Load & process scanning

- select folder containing MANDEYE data
- observe trajectory

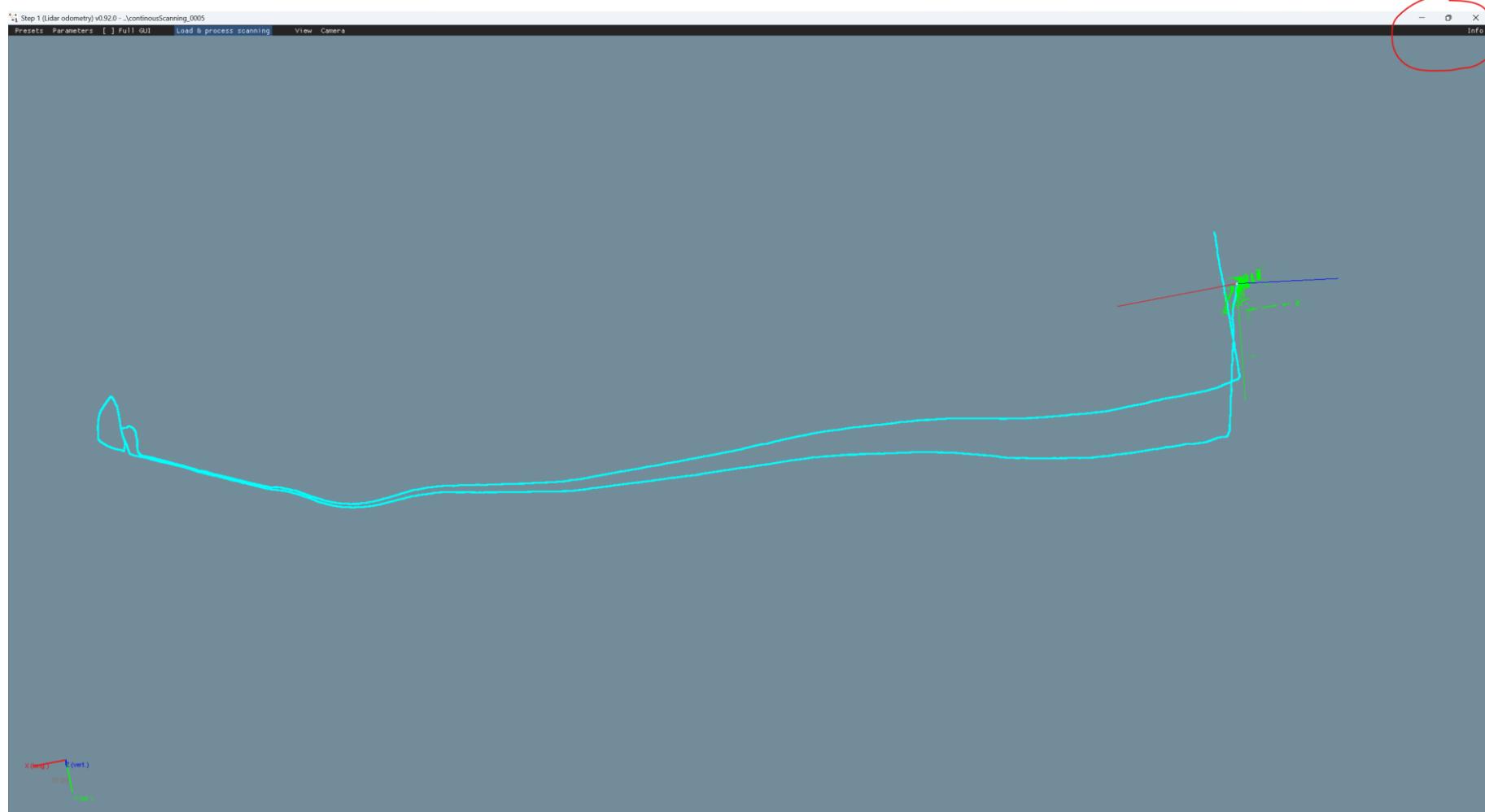


LiDAR inertial odometry



Software: lidar_odometry_step_1.exe

Finally, program will inform where data is saved.



Inspect data with



multi_view_
tls_registrat
ion_step_2.
exe

QC 2

IMU versus LiDAR inertial odometry error quality check



multi_view_
tls_registrat
ion_step_2.
exe

▼ Single session processing

Simple_gui Is ground truth
 show_imu_to_lio_diff

working directory: C:\data\2025\claims\tomi\z-plakatu\continuousScanning_0083\continuousScanning_0083\lidar_odometry_res

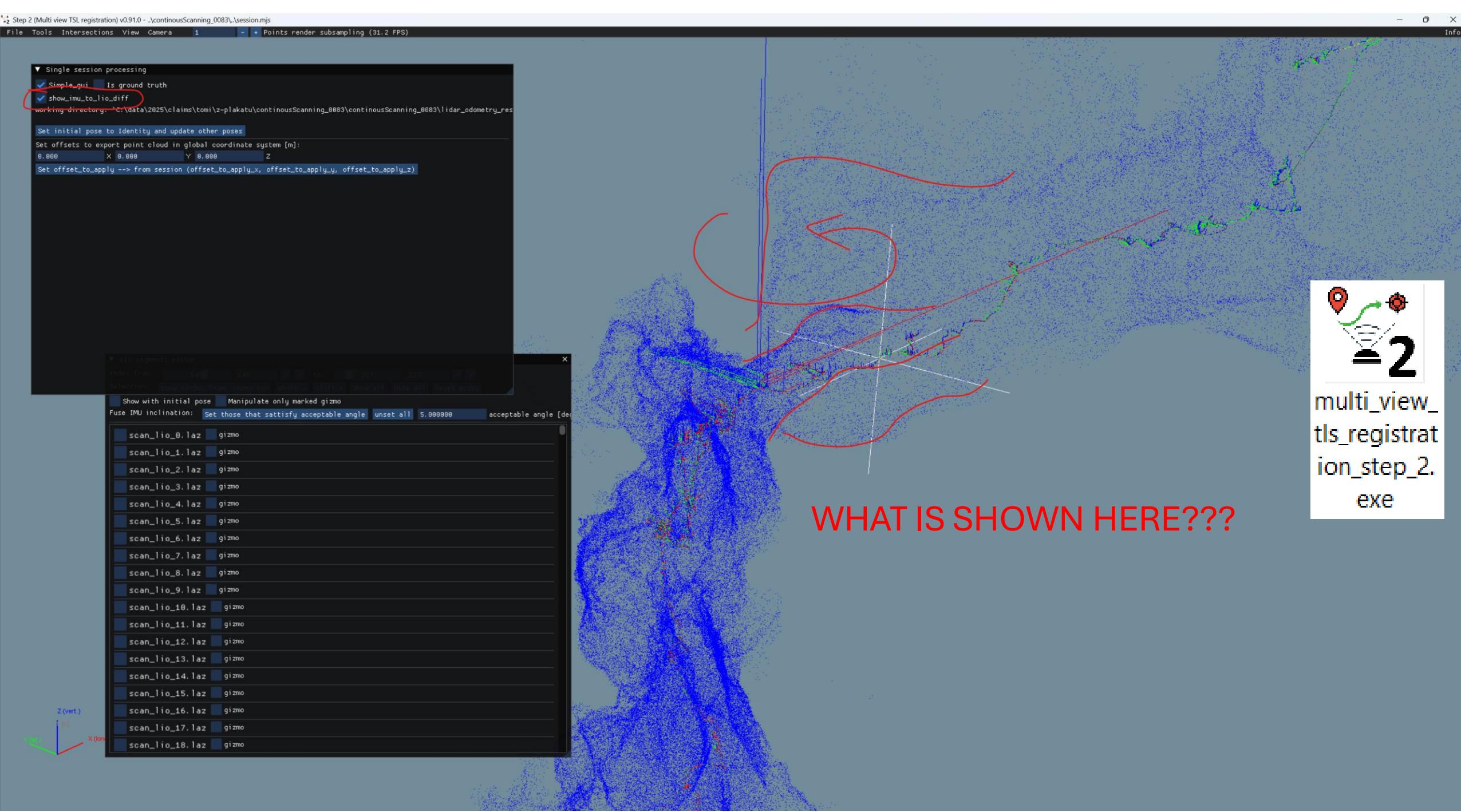
Set initial pose to Identity and update other poses.

Set offsets to export point cloud in global coordinate system [m]:
X 0.000 Y 0.000 Z 0.000

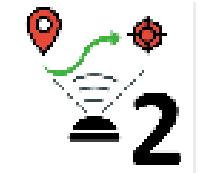
Set offset_to_apply --> from session (offset_to_apply_x, offset_to_apply_y, offset_to_apply_z)

▼ LIO segments editor

Index from: 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 1230 1235 1240 1245 1250 1255 1260 1265 1270 1275 1280 1285 1290 1295 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Split session ToDo

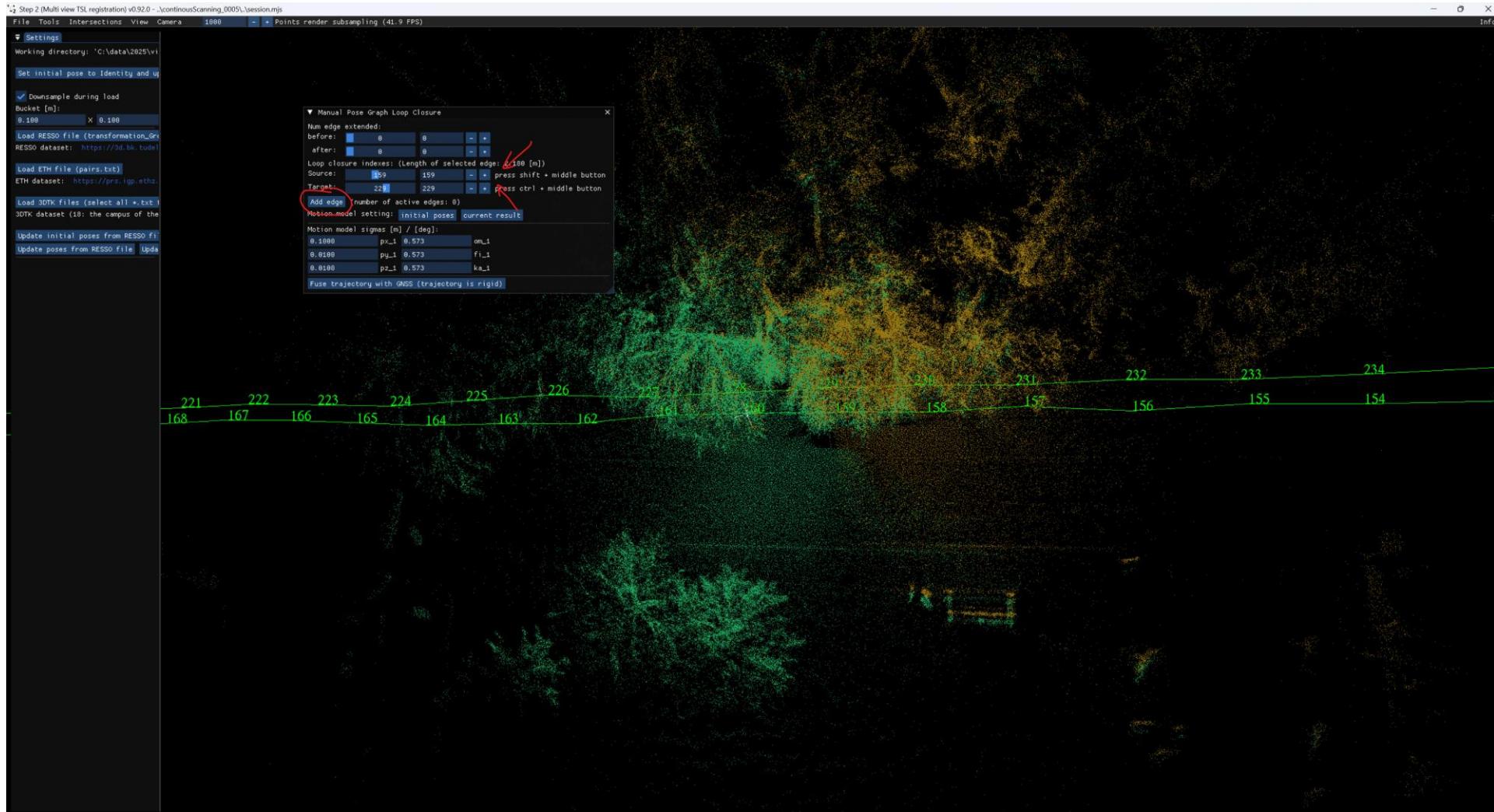


multi_view_
tls_registrat
ion_step_2.
exe

Once the error in session is identified it is advised to split session with omitting corrupted data



multi_view_
tls_registration_step_2.
exe

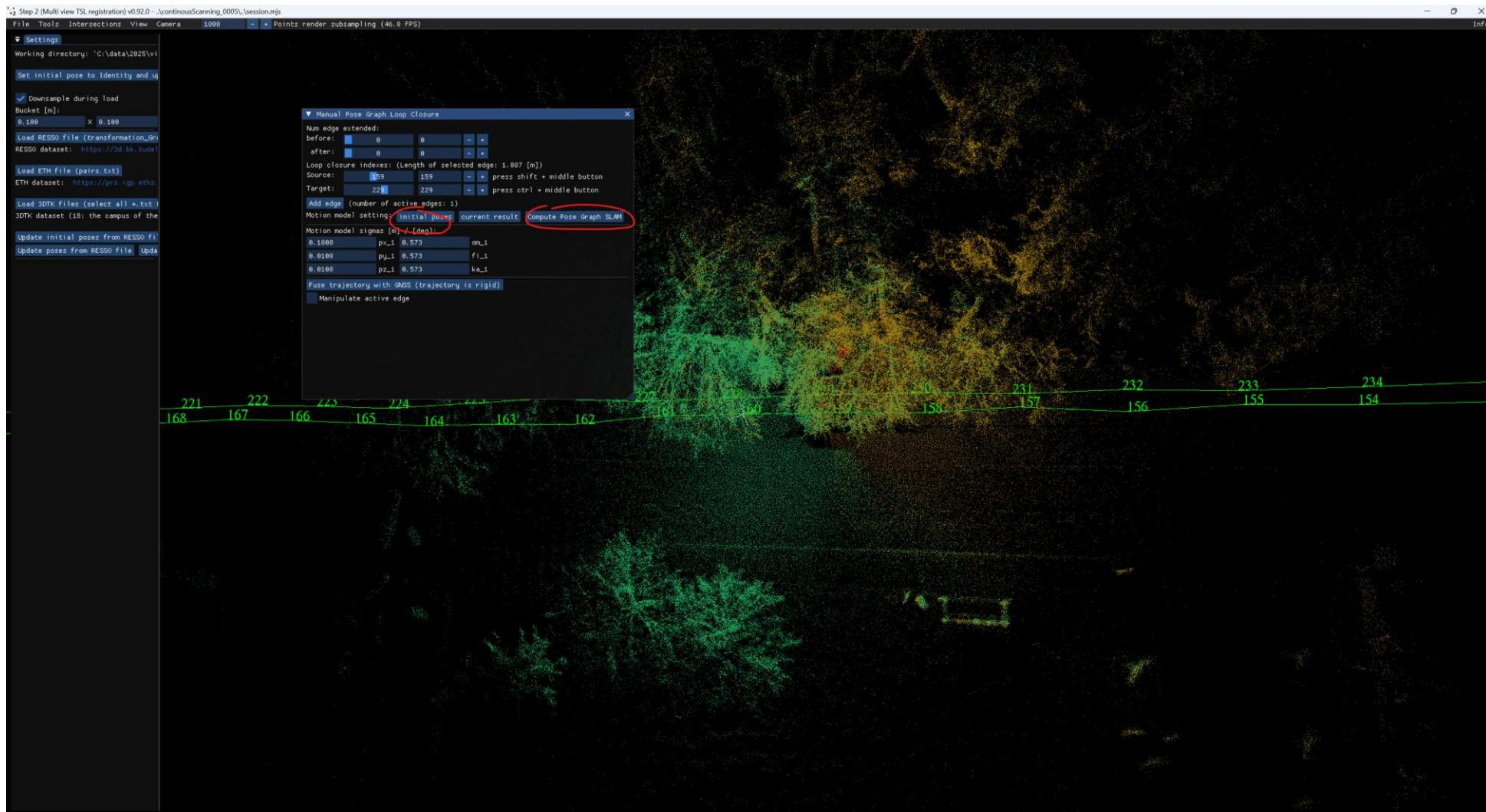




multi_view_
tls_registrat
ion_step_2.
exe



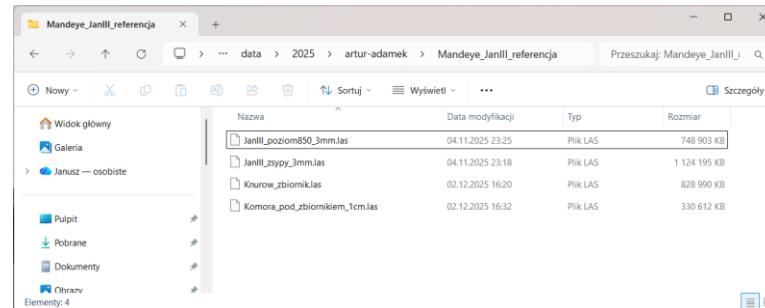
multi_view_
tls_registration_step_2.
exe



Georeferencing to ground truth point cloud

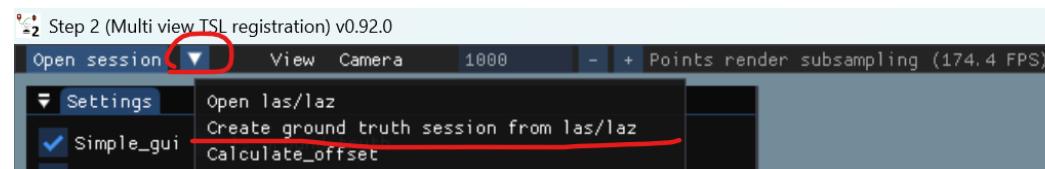
Creating ground truth session from point clouds

- 1. Using *multi_view_tls_registration_step_2.exe*
collect ground truth point clouds (laz/las) in one folder

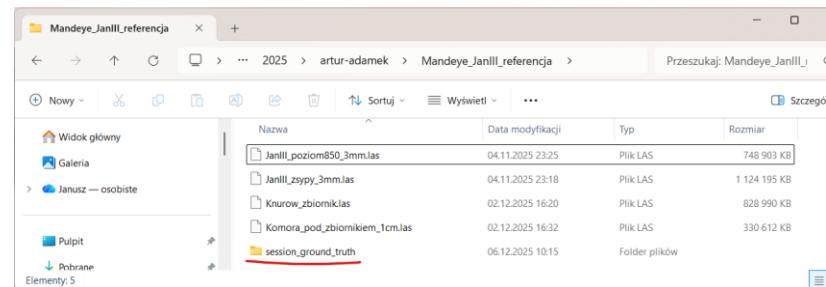


[multi_view_tls_registration_step_2.exe](#)

- 2. Click in menu *Create ground truth session from las/laz*



- 3. New session_ground_truth will appear -> use it in step3

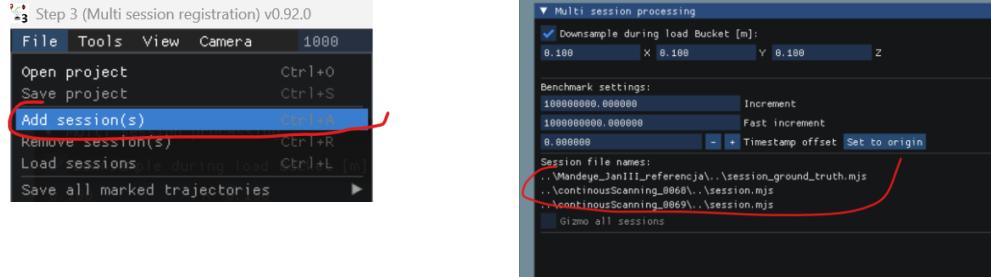


Creating multi session project

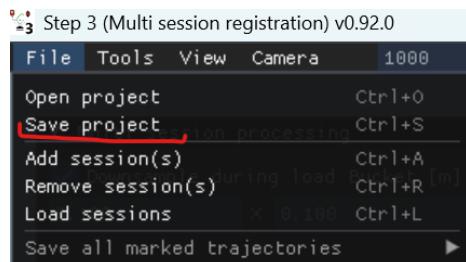


multi_view_
tls_registration_step_2.
exe

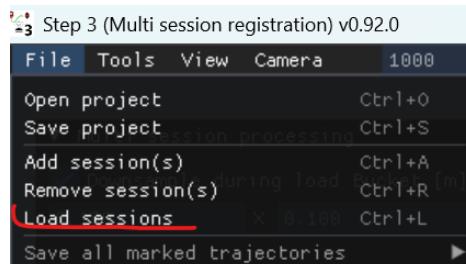
- 1. using *multi_session_registration_step_3.exe* add session to project



- 2. Save project



- 3. Load sessions





multi_session_registration_step_3.exe

Multi session project – important GUIs

- 1. downsample point cloud
- 2. sect sessions to work with (select 1 to work like in step2, select 2 to add Edge between two sessions)
- 3. select 3 to apply pose graph slam

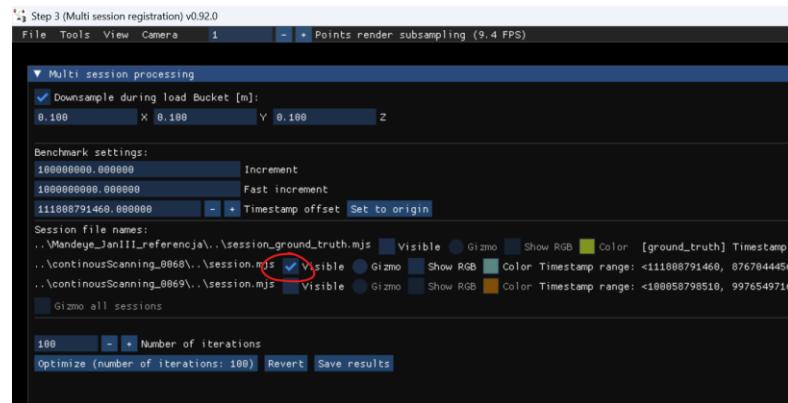


Multi session project – create edge for single point cloud

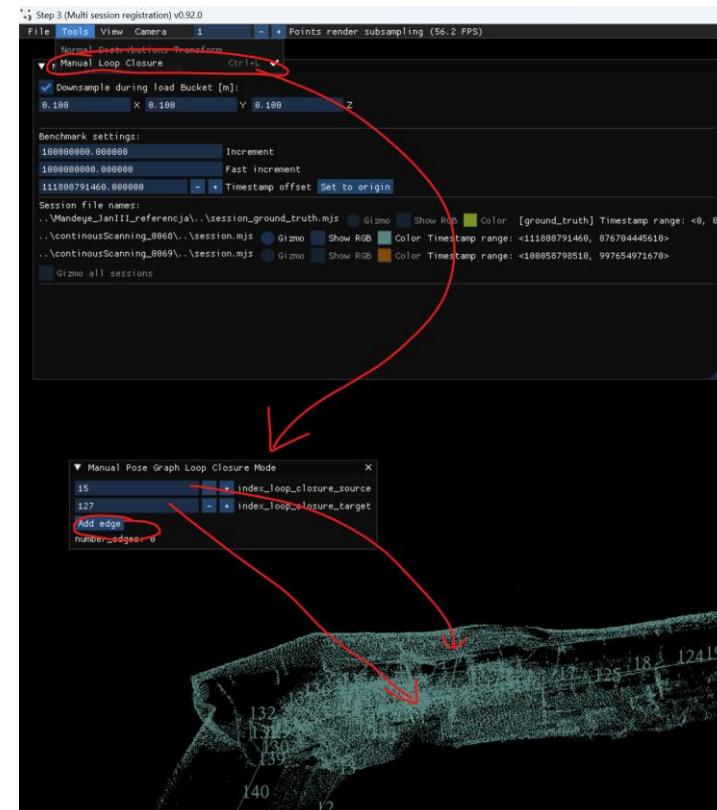


multi_session_registration_step_3.

- 1. Select 1 session



- 2. Select *Manual Loop Closure*
 - 3. Choose 2 nodes
 - 4. Click *Add Edge*

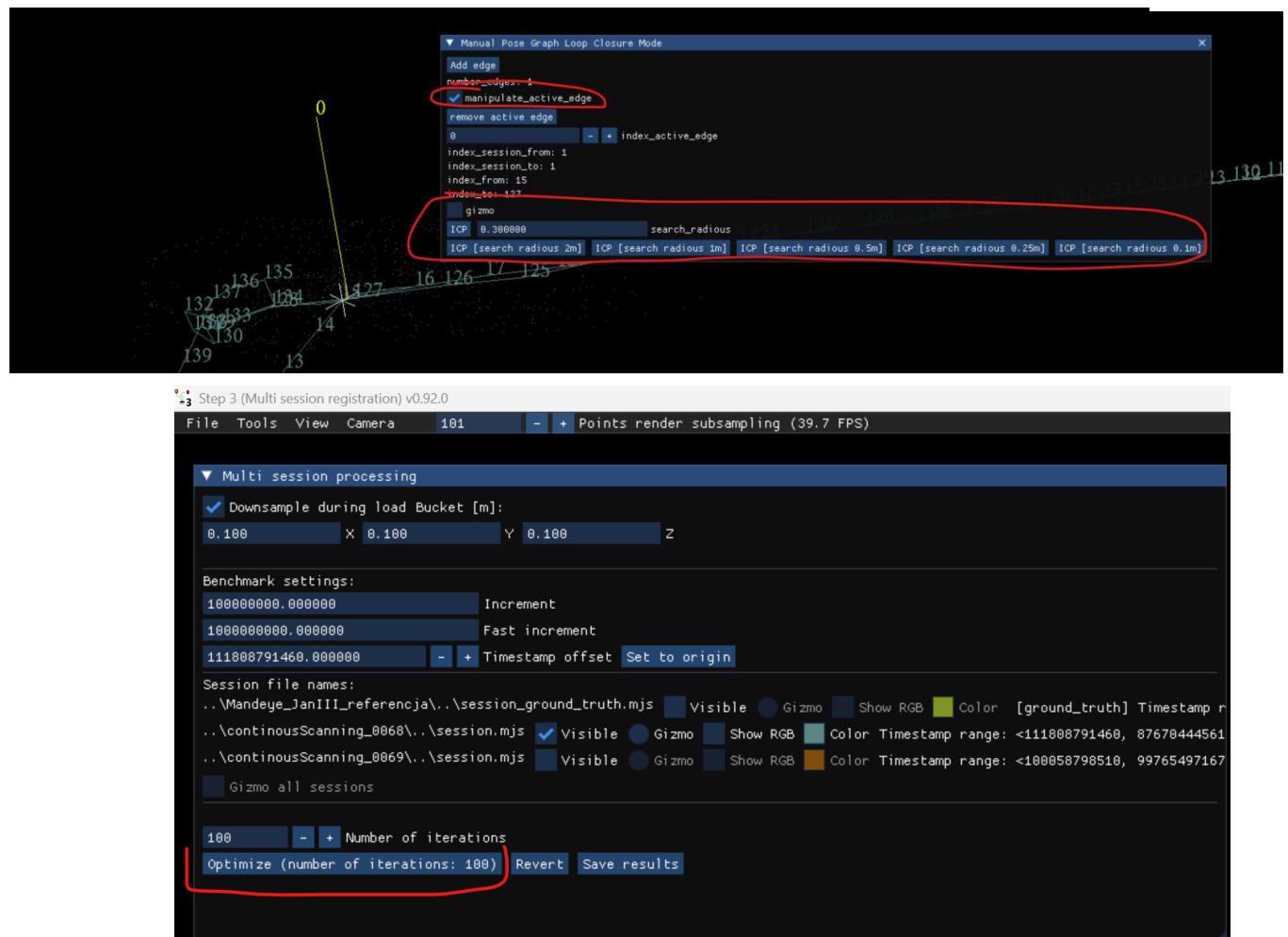




multi_session_registration_step_3.exe

Multi session project – create edge

- 1. Select *manipulate_active_edge*
- 2. Use ICP to align two point clouds



- 3. Apply pose graph slam

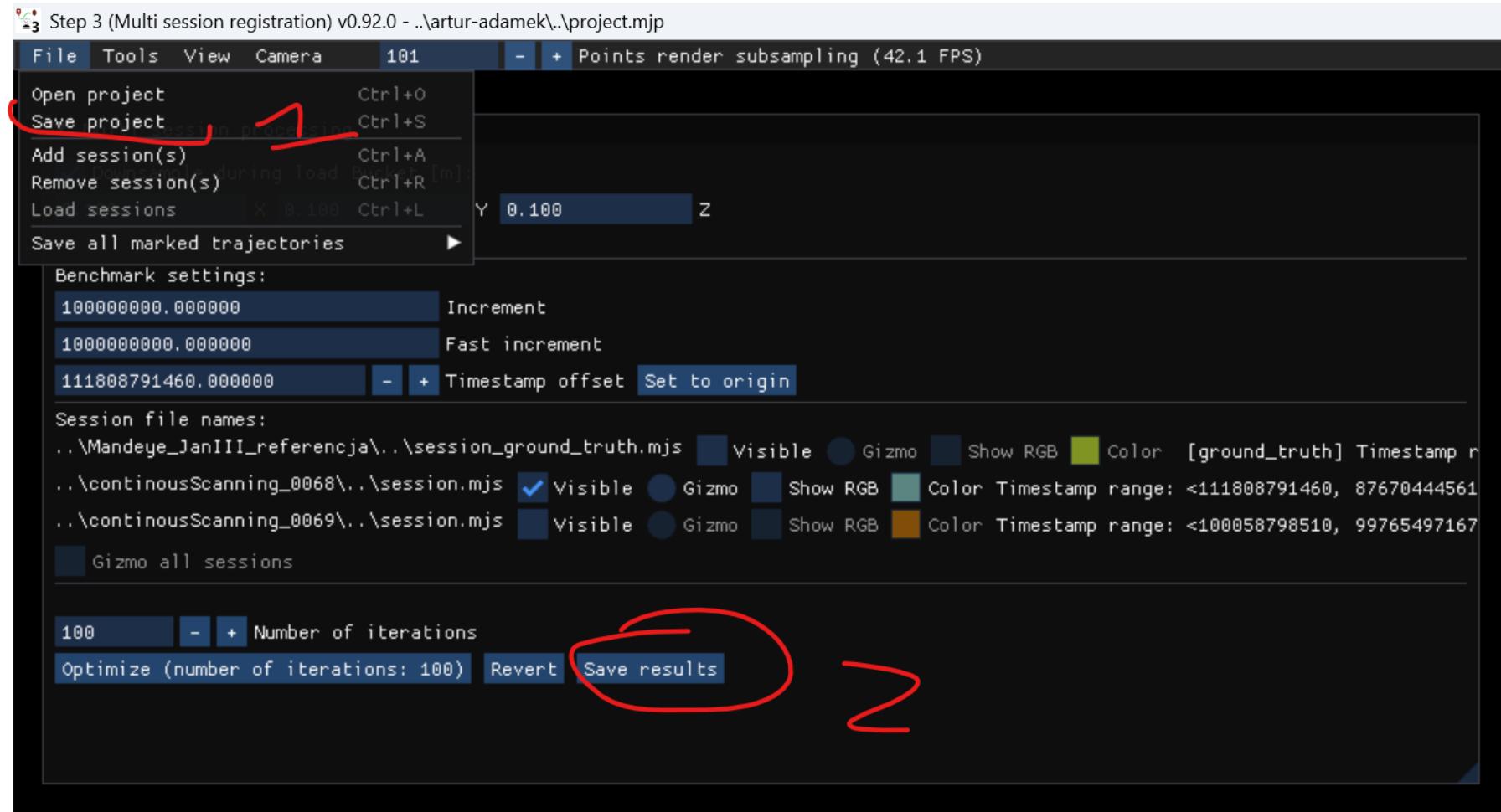


multi_session_registration_step_3.

exe

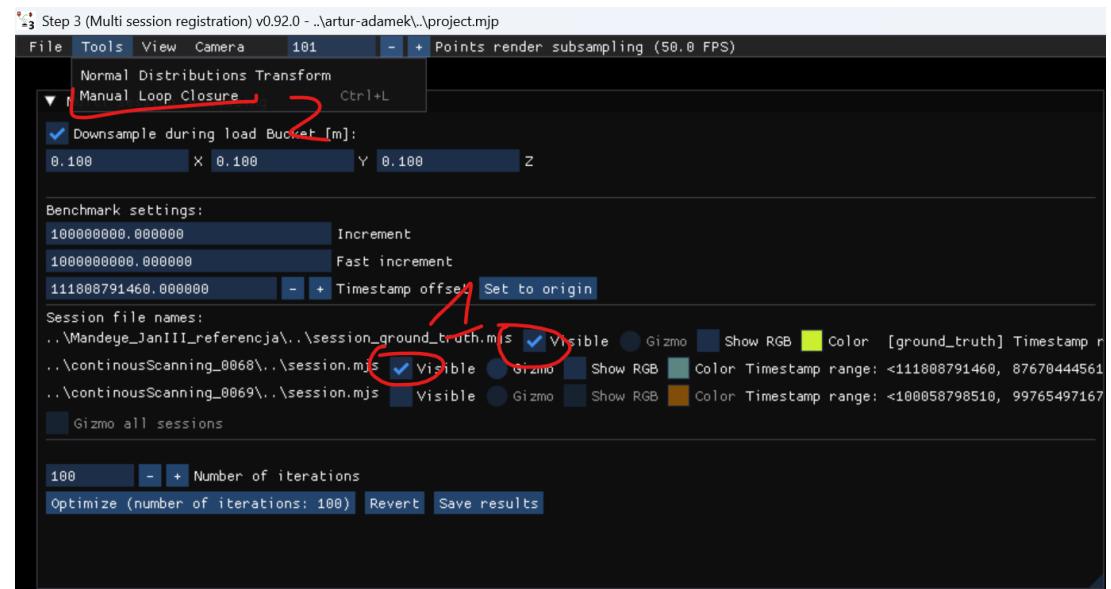
Creating multi session project – save intermediate results

- 1. Each time you add edge it is advised to save results (two steps)



Creating multi session project – create edge for two point clouds

- 1. Select two point clouds
- 2. Select *Manual Loop Closure*

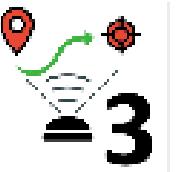


- 3. Add Edge and use ICP to align two point clouds



multi_session_registration_step_3.exe

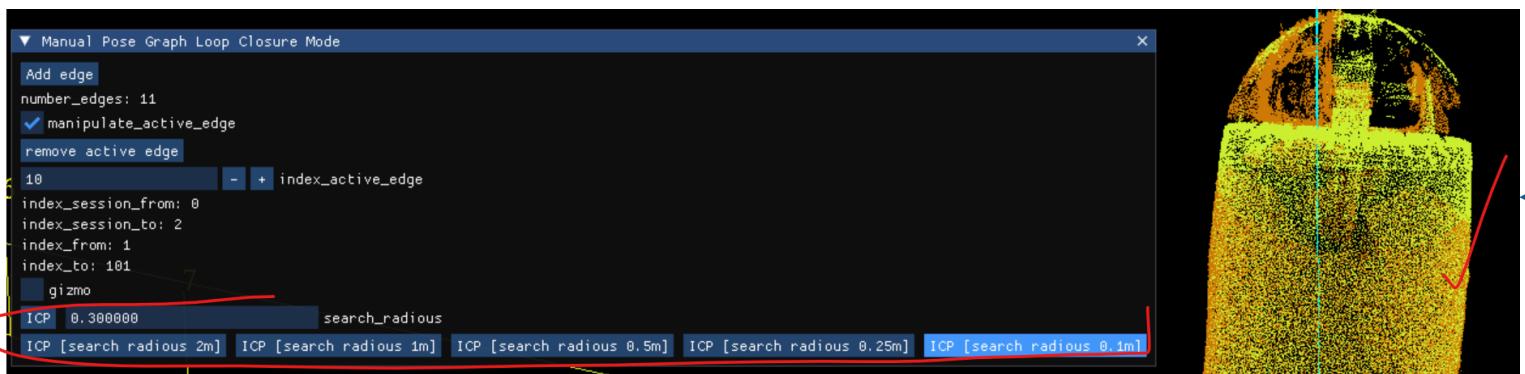
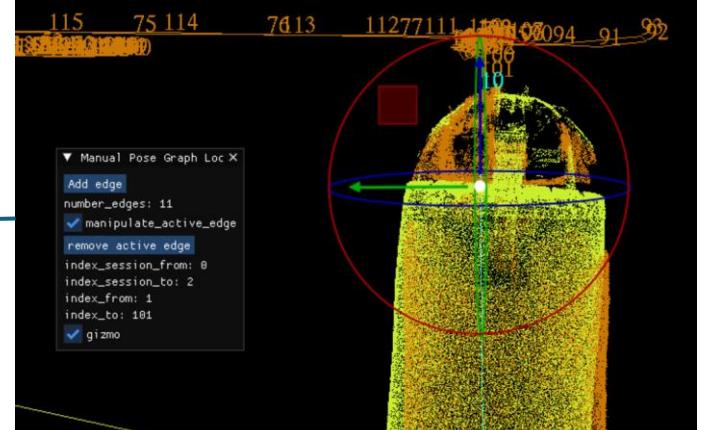
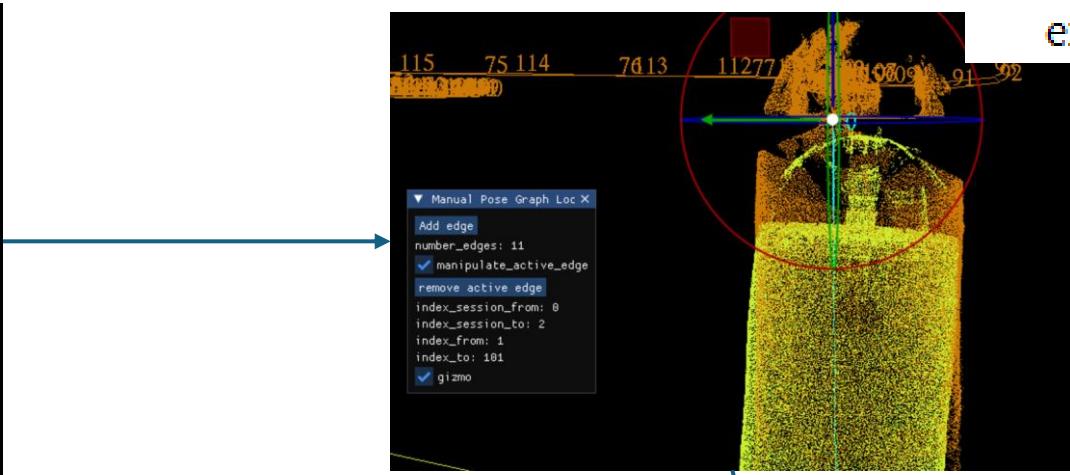
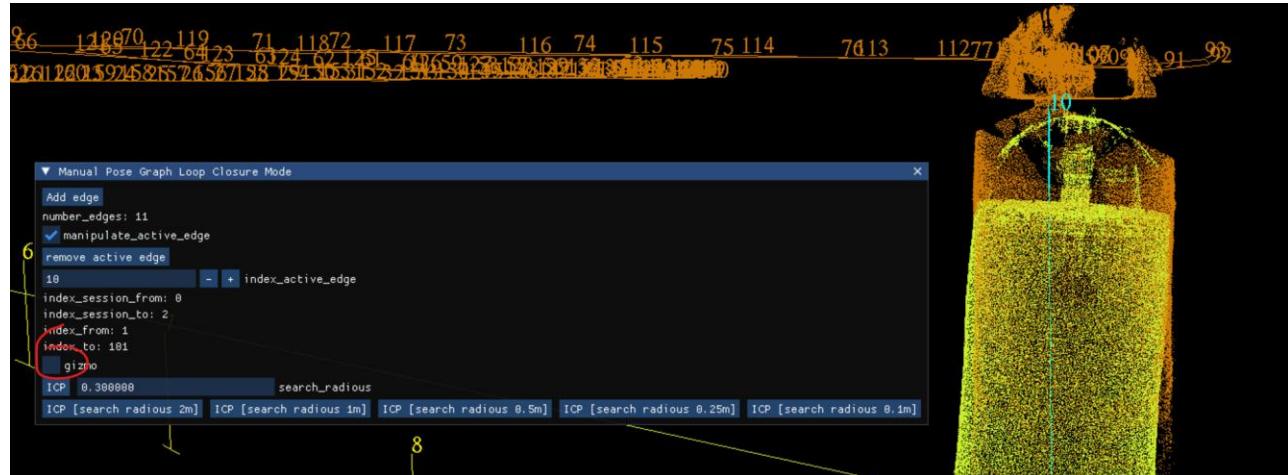




multi_session_registration_step_3.

Creating multi session project – manual edge alignment with gizmo

- 1. Use gizmo to align manually if necessary, finally ICP

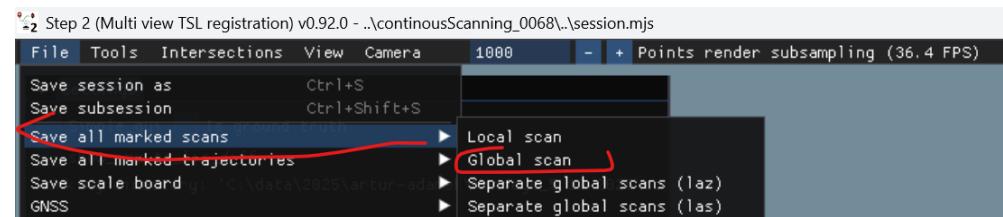
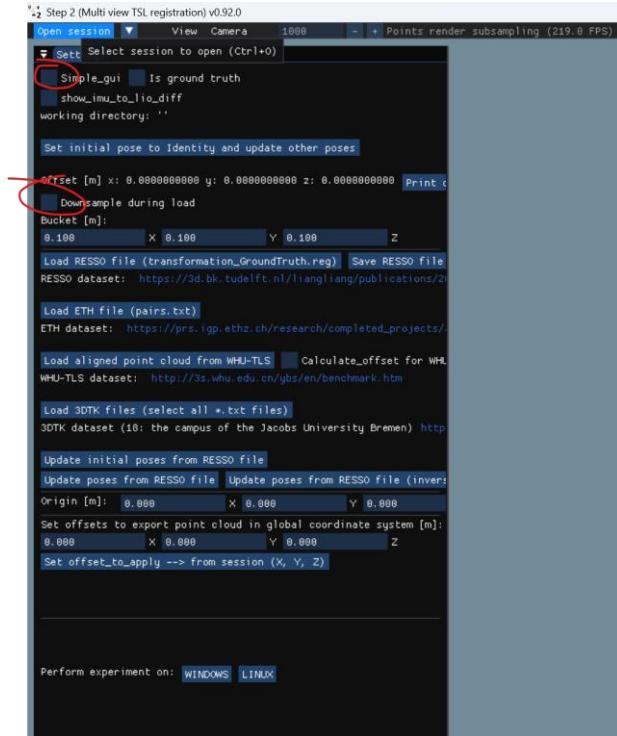
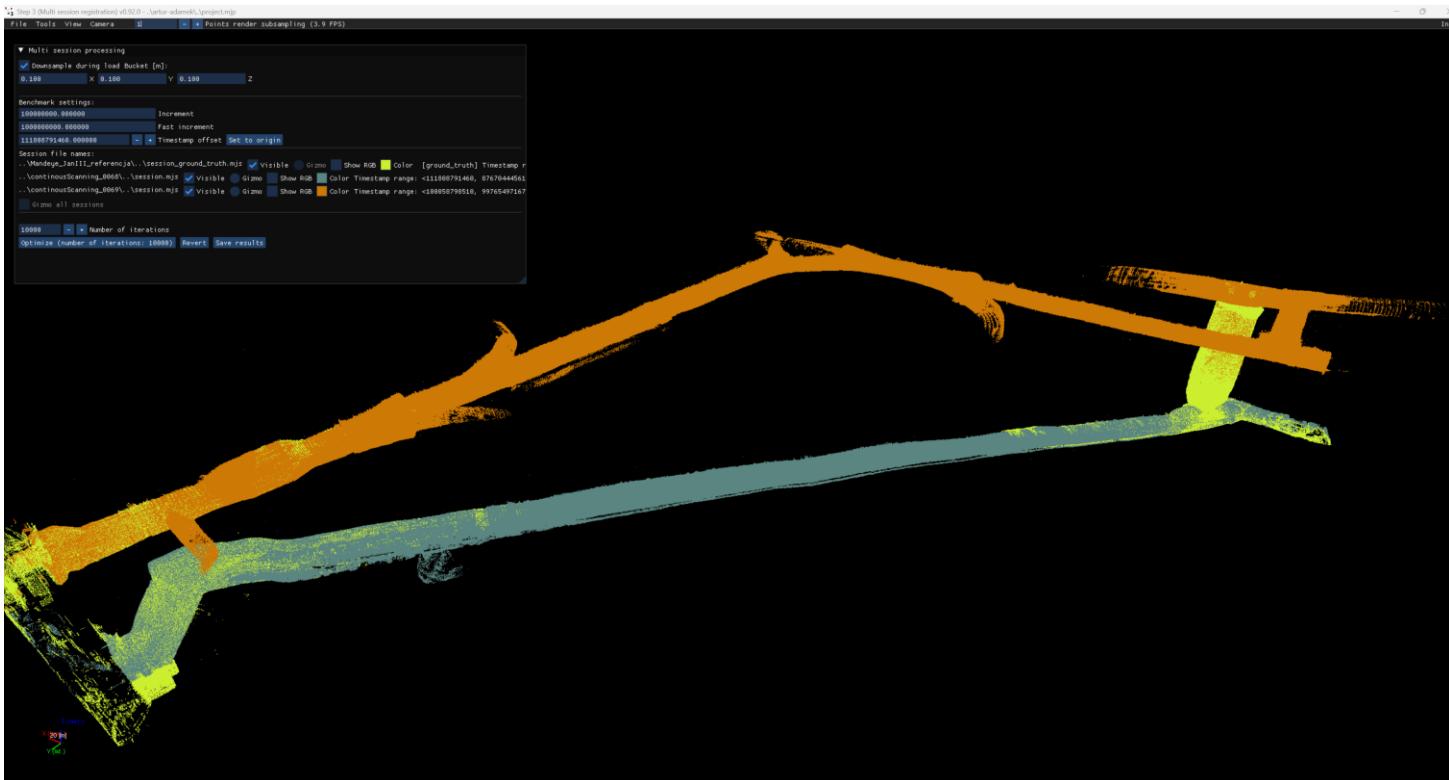




multi_session_registration_step_3.exe

Multi session project - final step

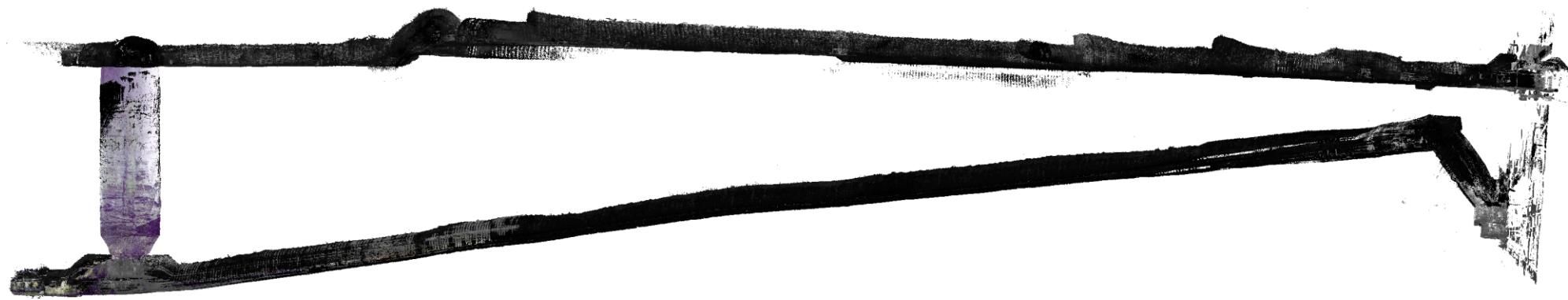
- 1. Publish data using *multi_view_tls_registration_step_2.exe* (remember to unmark 'downsample during load')



Multi session project - inspect data in CloudCompare



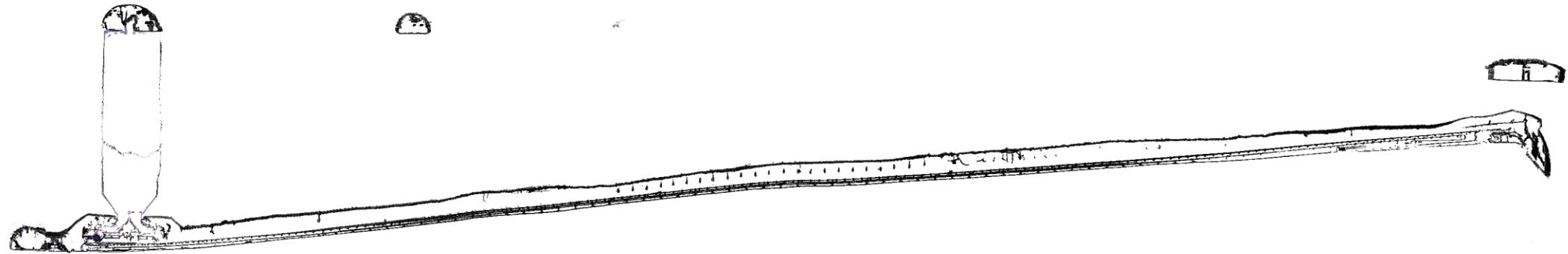
CloudCompare



Multi session project - inspect data in CloudCompare



CloudCompare



Multi session project - inspect data in CloudCompare



CloudCompare



Multi session project - inspect data in CloudCompare



CloudCompare

