Ship Hull Inspection Using Light Detection and Ranging

Prior work

BlueFin HAUV (Hovering Autonomous Underwater Vehicle) for ship hull inspection. Using Doppler Velocity log and ring laser gyro along with sonar for drift free localization on large metal structure

Motivation

Sonars are not conducive to high resolution mapping and cameras are not feasible for murky water
LiDARs allow for high resolution scans in such an environment

Methods

1. Points are recorded in sensors field of view
2. Robot geometry is used to find points location relative to the center of the robot
3. Robot's current 3 dimensional orientation and 3 dimensional position are taken into account to find true coordinates of points in real space.
4. Multiple scans are integrated together over time to create large maps of the ship's hull
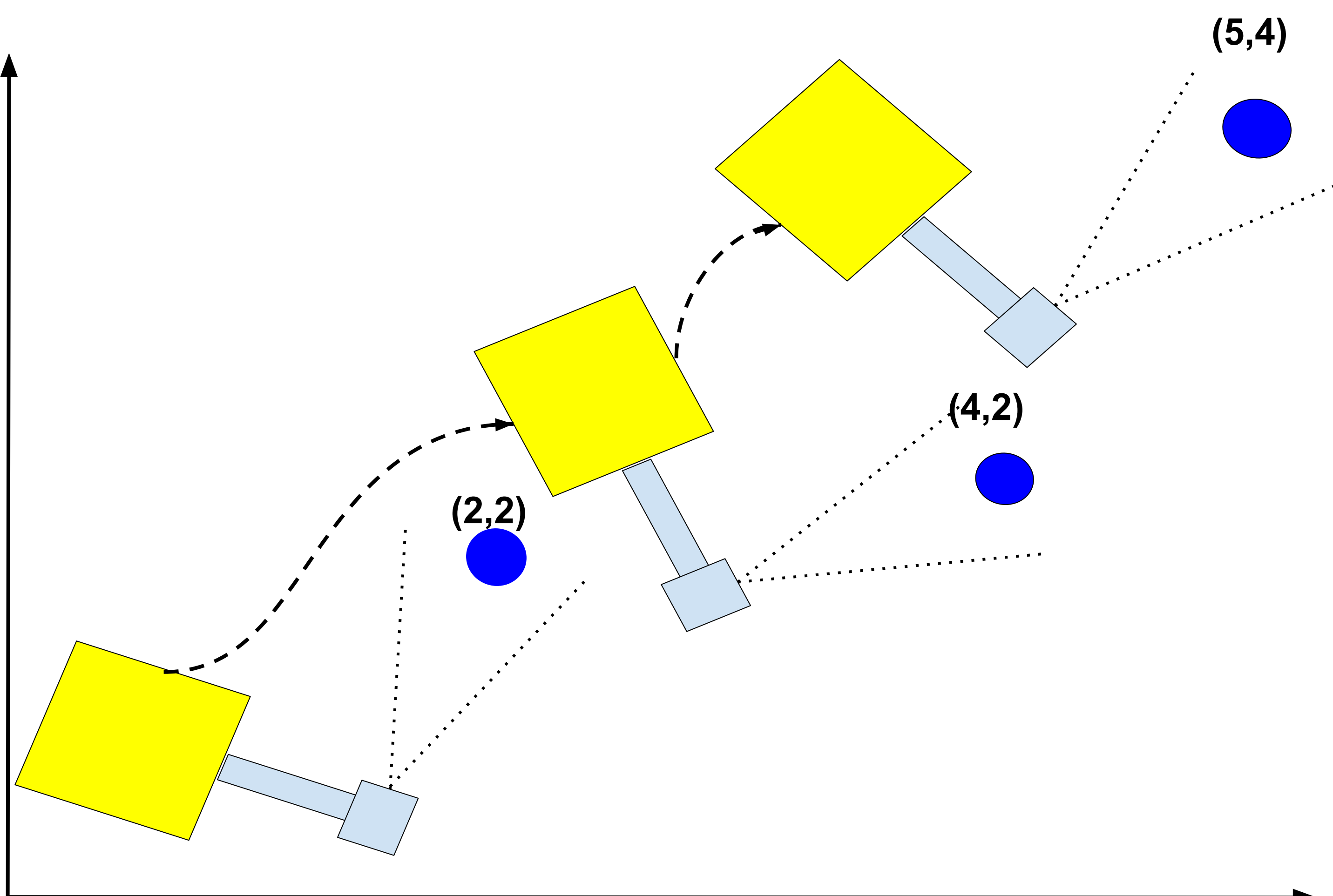
Results

Initial results using rotating head for capturing static 3d scans
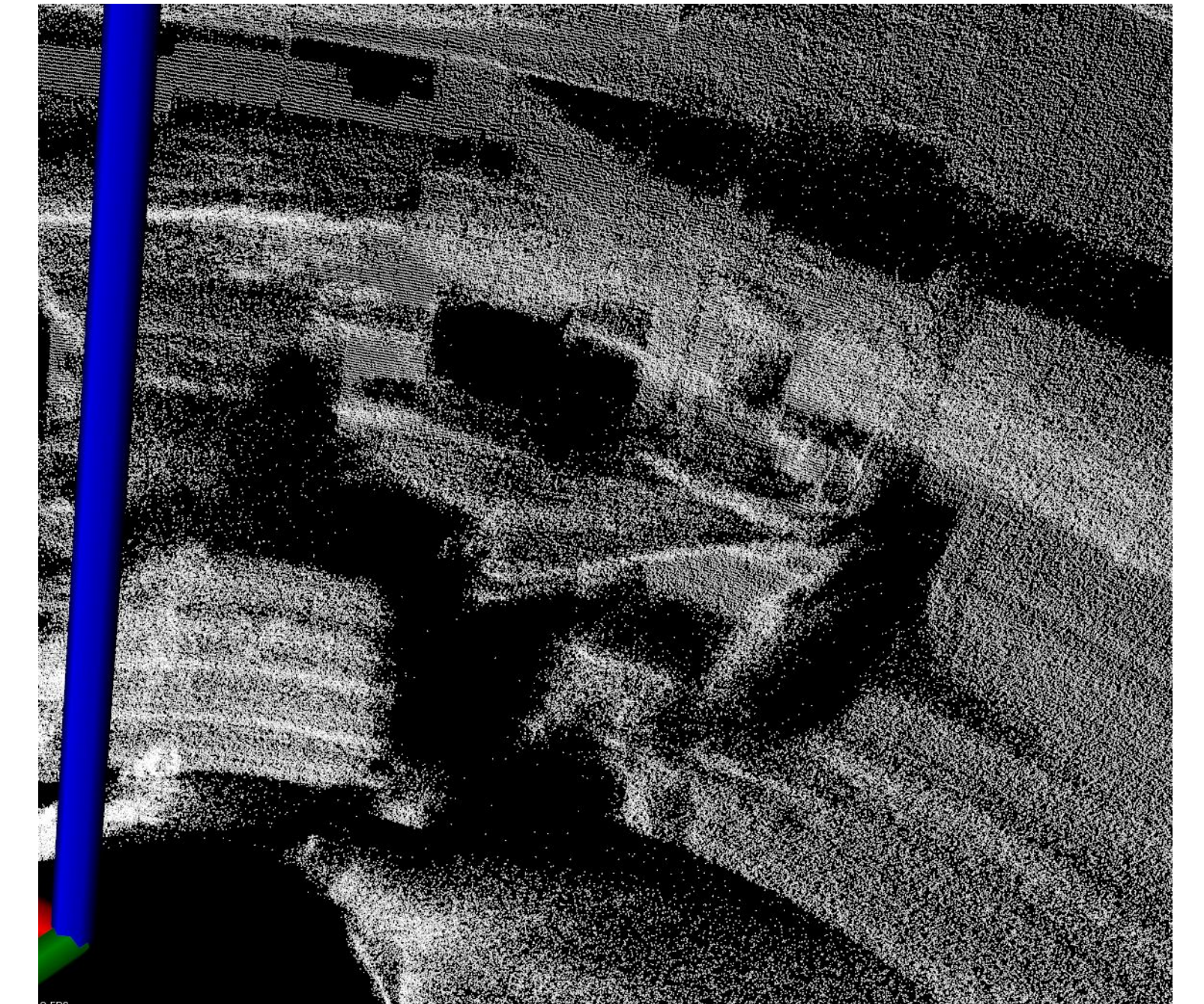
Final results using fixed LiDAR over several seconds of movement across ships hull