

Final Update

The purpose of this project was to develop a system which returns an accurate three dimensional representation of the environment around the autonomous boat used in the RoboBoat competition. A camera, laser scanner, embedded device were selected to meet these needs. There were significant developments within each subsystem. Successful communication between the devices enabled data capture and processing. However, full system integration remained incomplete because of timing issues. The system is able to process the acquired information, but the processing speed is too slow to produce an entire 360° scan. Using test data from the scanner the data organization scheme proved to be effective. Further processing of this data was successful in obtaining the location of the nearest object as well as a color overlay image that can be used in registration.

Potential future work for this project may include multi-threading to improve processing speed and aid complete system integration for practical use. In additions, registration of the image and point cloud keypoints will improve the precision of this overlay. This registration will reduce the effect of a time delay and 3D point cloud distortion when determining object location and distance within a 2D image.