Projects

Comp-417 Fall 2013

List of Projects:

1. Underwater Robot Simulator in Gazebo
2. Husky – Adapt the GVG exploration and mapping from the TurtleBot2 to the Husky
3. Husky – Adaptable Android Controller for multiple robots
4. Line fitting from Laser data
5. Map Verification, in GVG using the solution to the CPP.
6. Bundle Adjustment using images from a bag file generated by the Aqua underwater robot
7. Bibliography search and review report – Cooperative Localization
8. Bibliography search and review report – Suggest Topic
9. Multi-Robot GVG-Exploration in Stage
10. Map merging: ROS-node
11. Compare three feature tracking methods using images from a bag file generated by Aqua
12. Wireless BoeBot: Grid Mapper

1. Underwater Robot Simulator in Gazebo
   - Jonathan Fokkan, Dwijesh
2. Husky – Adapt the GVG exploration and mapping from the TurtleBot2 to the Husky
   - David Whitney,
3. Husky – Adaptable Android Controller for multiple robots
   - David Danielson, Eugene Jancorda-Vadnais and Mathieu Beaudoin

Line fitting from Laser data

- Line fitting in a set of points
- Implement split and merge functions to achieve correct fit
- Implement adding capabilities to merge more than one scans

Map Verification, in GVG using the solution to the CPP.

- Get the GVG Map from the GVG node
- Generate an Euler circuit on a GVG map from the solution of the CPP
- Guide the Robot in Stage to follow the Eulerian circuit

CPP: Chinese Postman Problem

Bundle Adjustment using images from a bag file generated by the Aqua underwater robot

- Use the image_proc pipeline to get rectified images
- Use the Bundler software to generate a trajectory of the robot

Bibliography search and review report – Cooperative Localization

- Start from an initial list of papers (provided)
- Search forward and backward for relevant citations
- Compile the bibliography using bibtex
- Produce a report

Multi-Robot GVG-Exploration in Stage

- Use the implemented single robot GVG-Exploration, extend it to multiple robots.

Map merging ROS-node

- Create a ros not that will receive two maps in the form of state and covariance matrix
- Implement map merge based on an existing matlab implementation

Compare three+ feature tracking methods on a bag file from Aqua

- Read images from the image_proc pipeline
- Use openCV to test 3+ feature detectors and matchers
- Report on your findings

Wireless BoeBot: Grid Mapper

- Use an extra communication module to obtain connectivity with the laptop.
- Implement a grid mapper based on the sonar data collected by the BoeBot