

Progress Review 1

Individual lab report – 02 || October 23, 2015

Team Daedalus

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Team Members:

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Dorothy Kirlew

Richa Varma

Shivam Gautam

1. Introduction

This lab report covers the work done by Team Daedalus on the various subsystems in the project Auto-park for Social Robots. The preliminary tasks completed before the lab include:

- Selection and acquisition of mobile platform for initial testing
- Integration of mobile platform with microcontroller board, as seen in Figure 1
- Hardware selection for communication network – Xbee DigiMesh 2.4
- Hardware selection for vision subsystem – Kinect v1
- Establish Bluetooth connectivity between Smartphone and Laptop

Ongoing tasks include:

- Creating a functional user interface for mobile application
- Setting up Arduino as a ROS node
- Interfacing Kinect via ROS
- Setting up the mobile platform



Figure 1 Mobile Platform

2. Individual Progress

After creating the conceptual design for the project, the tasks were delegated to team members based on their area of expertise and interest. My task was to go through the feedback provided on the Conceptual Design review and consolidate them. After aggregating all the edits, I worked with Dorothy to restructure and improve our document as required. These changes helped us in refining our content for the website as well.

My other task was to conduct a literature survey on possible solutions for the issue of obstacle detection and avoidance, and select a capable piece of hardware. This task was to be done with Mohak. After reading the available research papers, we reached a common consensus that Kinect is capable enough for our task. The capability of Kinect to generate both regular 2D images and model the environment using point clouds extracted from depth image data provides the flexibility to implement many powerful

algorithms for obstacle detection. I've started preparing the ROS environment required to interface with a Kinect by installing all the appropriate drivers and dependencies.

I've looked at the MRSD inventory and plan on getting a Kinect from there to start my initial testing. The testing will have some initial calibration tests and getting some raw data from the Kinect in a known environment to get a good understanding of its capabilities and limitations.

3. Challenges

The major challenge I face while working on the tasks is to coordinate with my team mates as everyone has busy schedules and it is difficult to find some time to sit down and work together. Most of the time spent together is used up in bringing everyone on the same page rather than actively collaborating or brain storming.

4. Teamwork

| Team Mate | Role |
|------------------|---|
| Mohak | Worked on the vision system |
| Bhardwaj | Collaboration: Worked together on literature survey and deciding on the way forward in terms of hardware and software. |
| Dorothy Kirlew | Worked on the development of the mobile app's GUI, CoDR feedback consolidation, and updating the website Collaboration: Worked together on updating the CoDR and website content |
| Shivam Gautam | Worked on the communication subsystem Collaboration: Exchanged ideas regarding possible methods of implementing the networking architecture |
| Richa Varma | Worked on the integration of mobile platform with actuator control board Collaboration: Helped in selection of a suitable platform |

5. Plans

- Acquire/ place order for the necessary hardware to test mesh grid setup (Shivam)
- Acquire Kinect and setup interface using ROS (Pranav and Mohak)
- Create communication channel between ROS and microcontroller (Shivam and Pranav)
- Demonstrate mobile application's back-end capability of establishing serial communication over Bluetooth (Mohak and Dorothy)
- Setting up the mobile platform by rigging up with necessary sensors (Richa)