Project Charter: Intelligent Maneuver (Version 1.0)
March 12, 2012

Overview

This project aims to customize a vehicle that uses LIDAR to move to a destination intelligently while avoiding obstacles in a constrained space.

Approach

The project requires integration of both hardware and software components, so we will use an iterative waterfall approach. Our team includes the following people:

- Hui Peng Hu
- Lily Lin
- Constance Lu
- Jonathan Wong
- Yoriyasu Yano

The project can be divided into these components:

- *Software* (2 people): WiFi communication, signal processing
- *Localization/Decision Algorithm* (1 person)
- *Hardware* (2 people): LIDAR, circuitry, vehicle

Objectives

- Mount the LIDAR onto the vehicle and connect it to the vehicle system
- Enable communication between the LIDAR, the vehicle system, and the user's computer
- Ensure the vehicle is able to optimally avoid obstacles

Major Deliverables (for the entire team)

- Research and become familiar with the individual components - **March 23**
- *Spring Break* - ***March 26-30***
- Communicate successfully between the vehicle and the base station - **April 13**
- Communicate successfully with LIDAR - **April 13**
- Ensure that vehicle avoids obstacles from point A to point B using LIDAR (to demonstrate that SLAM is implemented well) - **May 6**
- Prepare for the demonstration presentation - **May 8**

Constraints

- The May 9 deadline is a fixed deadline for the project demonstration
- The quadrotor may require more hardware interfacing than other vehicle alternatives
- We have many components to hack and put together

Risk and Feasibility

A risk is that using the vehicle to map the room may take too long to debug in a reasonable amount of time. We may be able to circumvent the debug cycles by breaking up the task into smaller components that can be debugged in parallel with shorter cycles.