Quadrotor Payload Delivery System

Version 1.2

Overview

Our project is to produce an automated quadrotor-based package delivery system.

Approach

We will take an agile development approach to our project. This will allow our schedules to adapt when the inevitable slip occurs. We will quickly develop the base system and then add features in a parallel fashion. We will have nightly builds and acceptance tests.

The project team will consist of the following people:

Andrew Wygle (6 hr/week for 7 weeks)   Ellery Cochell (6 hr/week for 7 weeks)
Kathy Sun (6 hr/week for 7 weeks)   Xiaozhe Shi (6 hr/week for 7 weeks)
Josh Hsiao (6 hr/week for 7 weeks)

Project management responsibilities will be shared among all group members, as the group is small enough to make consensus-building a practical decision-making tool, especially once we divide into sub-teams.

Objectives

- Locate and correctly choose among a large number of packages.

- Lift and set down a package carefully, without damage.

- Fly to a destination without hitting any intervening obstacles.

Major Deliverables

- A schedule and work breakdown, with time estimates.

- A prioritized list of features.

- A functional demo of the product in time for Cal Day on April 21st.

- A complete working delivery system in time for the end of the class on May 4th.

Constraints

All project members have other classes and therefore cannot devote all their time to this project. The Cal Day and end-of-class dates are hard deadlines, and seven weeks is not a lot of time to develop a complex system. Due to budgetary constraints, hiring subcontractors and using high-end equipment is not feasible. The final design must be as cheap as possible while still providing all functionality.

Risks and Feasibility

Our primary risk is a failure of the quadrotor or the obstacle avoidance system, leading to injury. This will be avoided by carefully controlling the environment of the drone until our confidence in the hardware and software is high, and incorporating numerous safety features. Another risk would be failure to meet the deadline. We will avoid this by carefully prioritizing features so that we can cut less important features in order to ship by the deadline, as well as having frequent meetings to ensure progress proceeds apace. This project is feasible in that all included technologies exist in some form, and we have planned out our schedule very precisely to ensure a timely release.