First Semester Progress Report
Programmable Flight Controller

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Abstract

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1 List of Acronyms

GUI - Graphical User Interface

2 Objectives and Deliverables

2.1 Overall Objective

The main objective of the project is to develop a programmable flight controller that responds appropriately to control inputs and disturbances. The flight controller will recieve control inputs over WI-FI from a base station. The base station can be any device that is WI-FI enabled and has the appropriate software installed. The software on the base station will be a graphical user interface (GUI) that allows the user to send control inputs to the drone and view statistics of the drone during operation.

The objectives of the project have been broken down into what will be accomplished in the first semester (Short term objectives) and what will be accomplished in the second semester (Long term objectives). These objectives along with specific details of each can be viewed in sections 2.2 and 2.3 respectively.

2.2 Short Term Objectives (October 2016 - December 2016)

2.2.1 Simulation

The simulations will allow us to gain an understanding of how the controller will respond to specific inputs. The simulation can then be tuned until the output is within the constraints set by Dr. Rhinelander. We will be simulating both the flight dynamics and controller using MATLAB and Simulink exclusively.

2.2.2 Construction of the Drone

The drone parts will arrive separately and assembly will be required. The extent of the assembly will be to attach the 4 brushless DC motors and batteries to the base of the drone. On top of the assembly the preliminary layout of the required hardware will be decided on. The layout is subject to change as we begin the final assembly in the second semester.

2.2.3 Initial Design of the Controller

A preliminary design of the flight controller with be constructed in software and tested. The results of the tests will allow us to gain insight on any changes that will be required to meet the constraints.

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