

DATE: February 10, 2020
TO: Dr. Yogananda Isukapalli
FROM: Chris Scott, Daniel Kluzner

SUBJECT: Quadcopter— ECE 153B Project Proposal

Purpose

Create a very simple functioning quadcopter that will respond to changing motor speeds, as well as joystick commands to move left, right, forward, or backwards.

Overview

We propose to make a very simple remote-controlled quadcopter. It would consist of a set of 4 motors that enable flight and movement about the yaw, roll, and pitch axes, and a joystick that controls it remotely. The quadcopter would carry with it the STM32L476G board (battery-powered), which would be wired to a wireless module. The joystick will interact with the module to relay instructions to the board, thereby controlling the movement of the quadcopter.

Goals

- 1) Activate motors, and be able to control their speed with varying pulse widths
- 2) Interface with the wireless module by sending signals from the joystick
- 3) Enable quadcopter to turn by applying different speeds to the motors

Peripherals

- 1) Joystick
- 2) Motors
- 3) Wireless module

Serial Interface Protocols

- 1) UART
- 2) SPI

Responsibility List

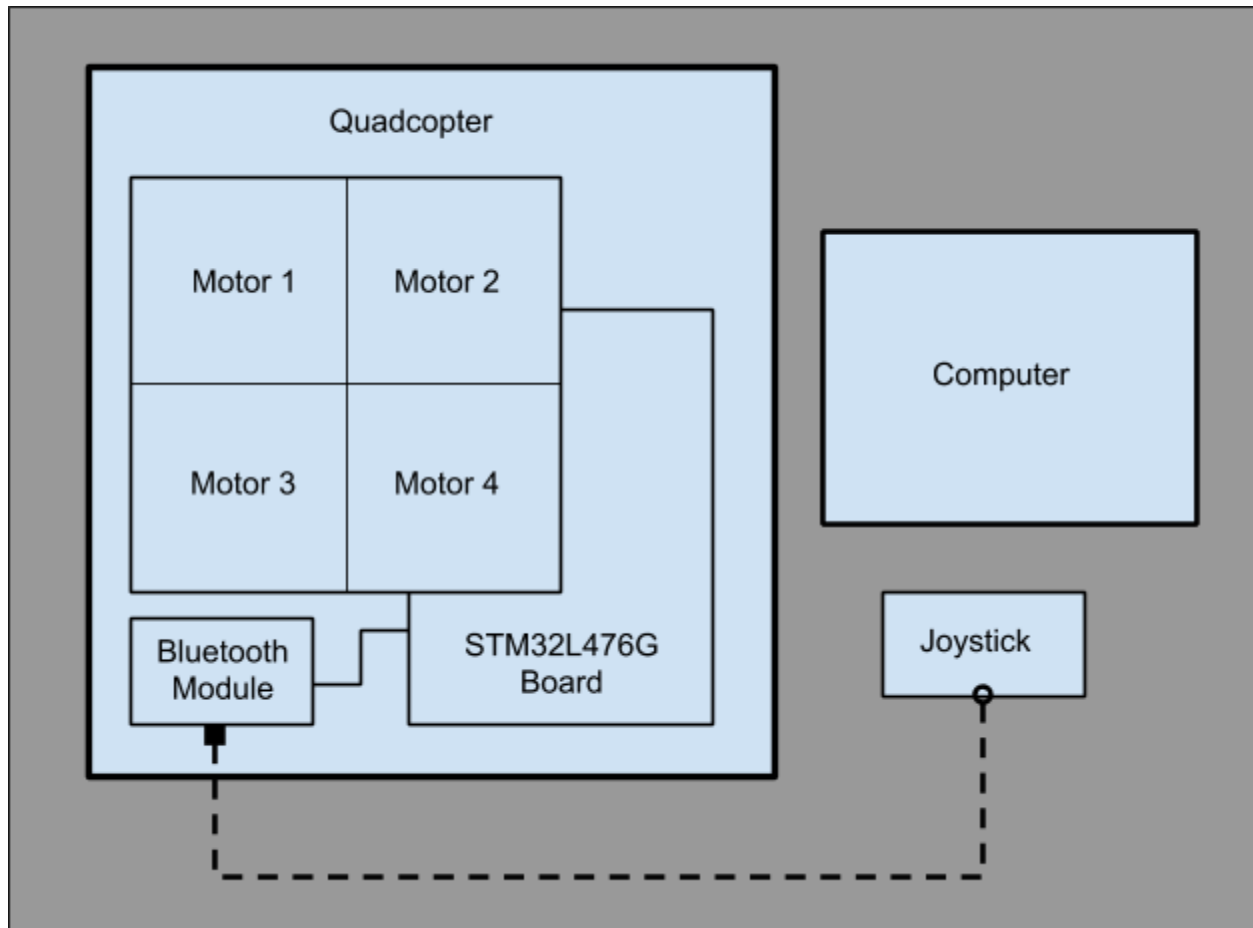
Most components of the project will be worked on– and reviewed– as a team, but ultimate responsibility and decision authority for each section is as follows:

- Project parts research and selection: Christopher Scott
- Microcontroller to motor communication: Daniel Kluzner
- Joystick to Microcontroller communication: Christopher Scott

Software Structure

Pressing the joystick in any way would generate interrupts, which will be handled accordingly. Each direction (which will most likely be up, down, left, right) will generate its own external interrupt signal, and a separate IRQHandler will be in place to increase or decrease select motor speeds accordingly. Timers will be used when sending signals to the 4 motors.

Block Diagram



Project Website

<https://sites.google.com/view/quadcopter-ece-153b-w2020/home>