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iOS Application Controlled Quadcopter

Abstract:
The goal of this project was to build a lightweight quadcopter which could be controlled from an iOS device.

The system consists of an iOS app which communicates over an adhoc wireless network with a TCP server running on an Arduino Mega. The iOS application processes the phone's gyroscope, accelerometer, and manometer data to determine pitch, roll, and yaw values to send to the quadcopter. Additionally, the app has a touch throttle to control the quadcopter's motor speeds. When the Arduino server receives these control values, it converts them to PWM signals, which are smoothed by low-pass circuits and sent to the quadcopter's associated RF transmitter. The quadcopter then receives these control values and passes them to the MultiWii flight controller which controls the motors, enabling flight.

Parts:

- 1 quadcopter frame
- 4 brushless motors
- 1 Arduino based flight controller (MultiWii)
- 1 3.7v battery
- 1 4 channel transmitter and receiver
- 4 0.1μF capacitors
- 4 100 kΩ resistors
- 1 Arduino Mega
- 1 CC3000 Wifi Shield
- 1 iPhone 6 Plus
- 1 wireless router