VANYA COHEN

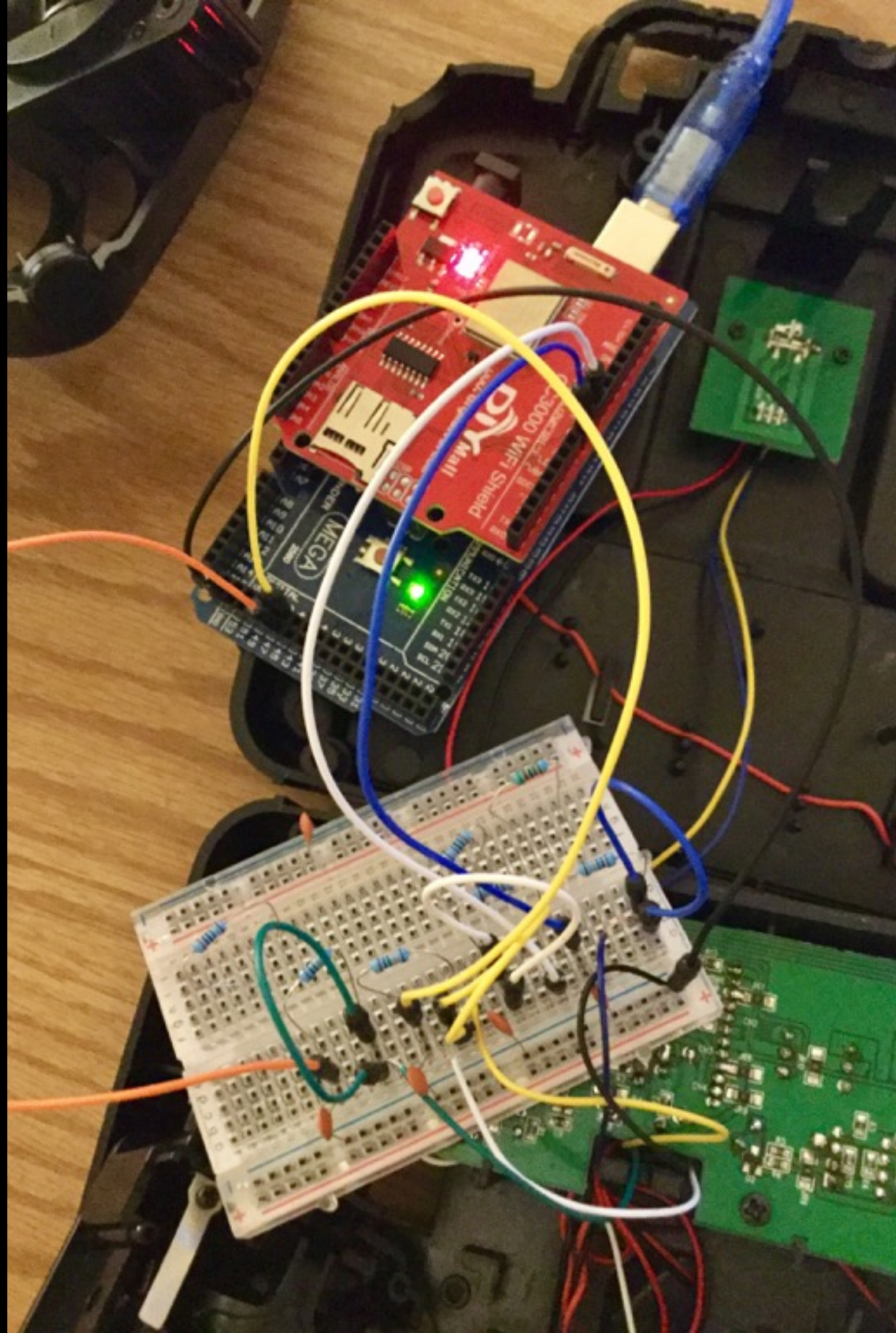
IPHONE CONTROLLED QUADCOPTER

GOALS

- Build an inexpensive quadcopter
- Control that quadcopter using a touch and motion based interface

DESIGN

- iOS app communicates over a TCP connection with a server on the Arduino
- App processes gyroscope, accelerometer, and magnometer data, and sends control values to the Arduino
- The Arduino converts these inputs into PWM signals, which are smoothed by low-pass filters and sent to the RF transmitter
- The quad then receives these control values and passes them to the MultiWii flight controller

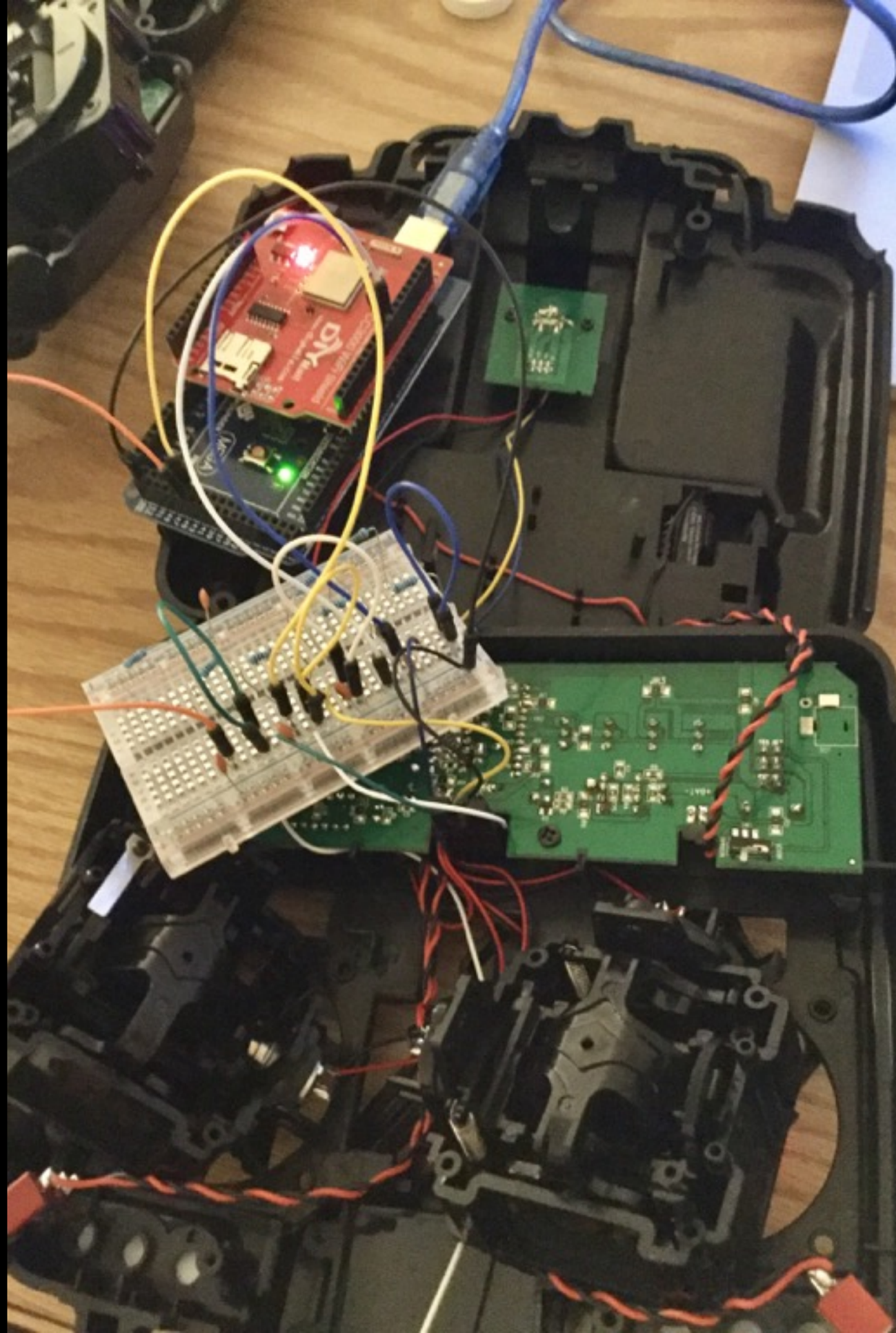


EXPERIMENTS

- Figure out what range of input voltages the RF transmitter will accept (resulting in at least one broken controller)
- Understand how to transform iOS motion data into appropriate control values
- Figure out which Arduino has enough ports to support both 4 PWM outputs and run the wifi shield
- Figure out which wifi router would allow for a mostly stable connection between the iPhone and the Arduino
- Experiment with different low-pass filters to smooth the PWM signal from the Arduino
- Practice flying the quad (even with the original controller, I still can’t without crashing!)

PARTS

- 1 quadcopter frame
- 4 motors
- 1 Arduino based flight controller
- 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
- 1 wireless router



FUTURE WORK

- Add more advanced controls to the quad and the app (GPS, high-level directional commands)
- Add stabilization through an optical flow sensor