Iron Man’s First Experiment

Nathanael Olander and Jake Kenniv

# Project Goal:

To create a wireless robot controlled via hand motions

# Project Description:

## Hardware:

We will have two components on two different breadboards, one of which will be controlling the servos for the robot and the other which will be receiving the data from the IMU breakout board (accelerometer and gyroscope) and then transmit the information via an IR LED to the robot. We will be mounting the IMU and associated PIC on a glove that will be worn by the user.

The robot board will have a PIC, a power switch, and the required circuitry to receive the IR signal from the glove and then running the two continuous rotation servos accordingly.

The glove board will have a PIC, a power switch, the transmitting IR LED, and the IMU breakout board, as well as potentially some status LEDs to visually display the current direction of control. The IMU board communicates via the I2C interface.

The kit from Adafruit provides both of the servos as well as the chassis, complete with driving servos/wheels and a support wheel.

## Software

The software will be fairly straightforward for the robot PIC, simply receiving IR signals and adjusting the servos appropriately.

The more complex software will be handled on the glove PIC, handling the receiving of the accelerometer/gyroscope data via I2C and then encoding and transmitting it via the IR LED.

# Components – Approximately $55.69:

* 2 PIC18F45K22 units - Lab
* 1 Mini Robot Rover Chassis Kit - <https://www.adafruit.com/product/2939> @ $24.99
* 1 9DoF IMU Breakout (Accelerometer/Gyroscope/Magnetometer) - <https://www.sparkfun.com/products/13284> @ $14.95
* 2 4xAA Battery Holder with On/Off switch - <https://www.adafruit.com/product/830> @ $2.95
* 2 Breadboards - <https://www.sparkfun.com/products/12002> @ $4.95
* 2 1N4003 Diode Rectifier – Lab
* 1 950nm Infrared LED - <https://www.sparkfun.com/products/9349> @ $0.95
* 1 IR Receiver – Lab
* 1 RGB LED – Lab
* 1 Glove – Personal
* Potentially 180 Ω & 330 Ω resistors for LED