Project Title: IR-guided Turret

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1 Project Goal and Functionality

Our project goal is to build a functioning stationed turret that can track the movement of its target using infrared emitters and sensors. It will have a LED that will turn on when detecting a IR remitter.

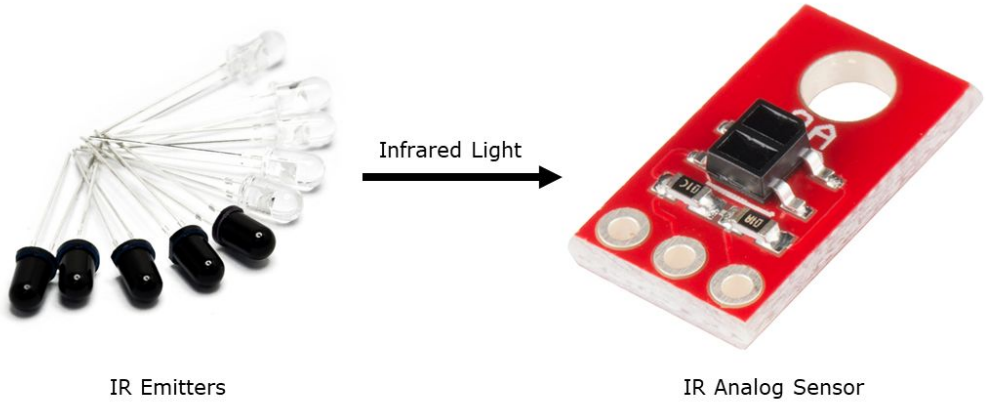

Figure 1: Infrared Sensors and Emitters
(Images found from Amazon and Sparkfun)

Our turret design will be controlled wirelessly from our laptops, as seen in figure 2. The default mode will have the turret move only when it detects something in front of it. If time permits, we will implement a manual setting in which we can control the movement of the turret from the computer.

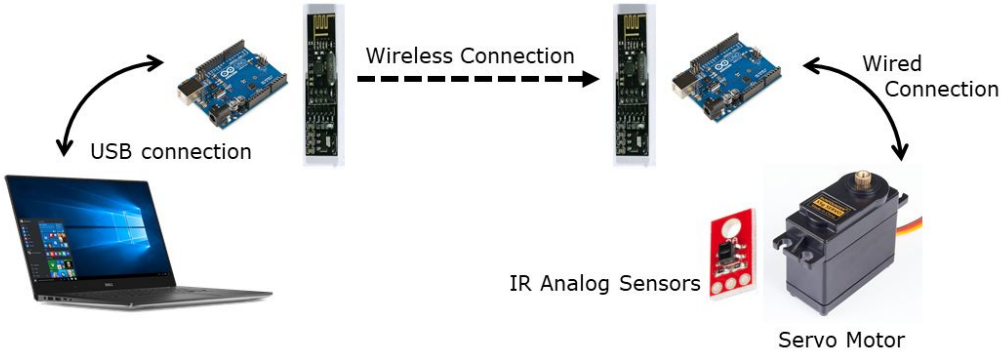

Figure 2: Functional Diagram of System
(Images found from Amazon and Sparkfun)

2 Hardware Components

The following hardware will be used for this project:

(a) 2 Arduino Boards, one from kit and another will be purchased.

(b) Servo motor to give the turret mobility, will be purchased online (Amazon link)

(c) IR emitters that will be purchased online (Amazon link)

(d) IR analog sensor (Sparkfun link)

(e) Wireless Transceiver (IEEE link)

(f) Power Supply (AA battery pack) to power our turret

(g) LEDs to test to see if our analog sensors are working

(h) Resistors from our kit

3 Design Timeline

(a) Week 5: Purchase components and configure schematic

(b) Week 6: Build and test the servo part with one Arduino board connected to a laptop.

(c) Week 7: Configure and test IR sensors while connected to first Arduino

(d) Week 8: Develop wireless control of servo motor with second Arduino and transceivers

(e) Week 9: 3D print an enclosure and put together all parts. Test and debug. If time permits, add manual control by joystick.

4 Documentation

How IR receivers and emitters work with Arduino:
https://roboindia.com/tutorials/digital-analog-ir-pair-arduino

For controlling servos with Arduino:
https://www.allaboutcircuits.com/projects/servo-motor-control-with-an-arduino/