**CS320-101: Software Engineering, Spring Semester 2022**

**Individual Project Proposal**

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**Face Tracking Camera**

**Summary:**

The following is a project to create a Webcam attachment that can track the user using two servos controlled by an Arduino. When the Webcam is connected to a computer, the Webcam’s software will activate and became looking for a person face then it becomes to track said face until the Webcam is turned off or when the software can not detect a face.

**Technologies:**

The development environment would be python/ Arduino’s python for the software portion. Will learn about the hardware development of an electric circuit for the servos and soldering for wires connecting to the servos, and the voltage regulator for the power. All while being connected to the Arduino. A 3d printer in creating a case or a container for the wiring.

Materials:

* 1 paperclip
* 1 rubber band
* 15 M2\*10mm self-tapping screws
* 1 Arduino UNO
* 3 Resistor 220 ohm
* 1 2.1\*5.5mm jack plug
* Linear Regulator (7805)
* 5 mm LED: Red
* 5 mm LED: Yellow
* 5 mm LED: Green
* heat-shrink tubing
* pin header
* 2 MG-90s servos
* 1 webcam
* 1 Hook Up Wire Kit, 22 AWG
* 1 9V 1A Switching Wall Power Supply

Tools:

* 1 screwdriver
* 1 Plier, Long Nose
* 1 Soldering iron
* 1 Wire Stripper & Cutter, 18-10 AWG / 0.75-4mm² Capacity Wires
* 1 multimeter
* 1 3D Printer

**Development Plan:**

The project was originally an in the Arduino project hub so the programmer will be using it as a reference as needed.

1. Have the Servos powered by the 9v Wall power supply
2. Have the servos and Arduino communicate with each other.
3. Have the software detect when there is a face shown on the Webcam
4. Have the servos be able to create rotations.
5. The software be able to communicate with the servos.
6. Have the software detect when the face is not in the center of the screen
7. Then put it all together

**Challenges:**

The project will be designed with an electrical circuit to power the motors . The project will need to combine software and hardware in a way that the programmer has not done. The project most difficult portion will be the hardware as that needs to be in a somewhat complete state for the software to be able to do its full functionality as it needs to work in tandem with the hardware. Below is a list of knowledge I need to know to complete this project.

* Learning Python
* Learning how to solder
* Understanding how to use Servos.
* Understanding how to use Arduino.