COSC 251 – Programming Languages

Project 2 - Raspberry Pi Security

Spring 2014

Objective: Build a simple security system utilizing your groups Pi and Python.

Your Group's Task: Implement a simple security system using motion detection and a USB webcam. The program should way for detection and sound an alarm which one is triggered.

Parts Supplied:

- Raspberry Pi
- Cobbler
- Breadboard
- USB Webcam
- Piezo Speaker
- 4 Push Buttons
- 4 10k Ω Resistors
- Various Jumper Cables

Requirements:

- The program should provide a GUI interface with 2 Buttons – one which arms the system and one which allows for changing of the security pin
- When armed, the Webcam should monitor its field of vision for movement of any kind.
- When movement is detected the program should sound an alarm using a piezo speaker. Make the alarm as obnoxious as possible.
- Once the alarm has been sounded the program should stop monitoring and the user should be prompted to enter in the security pin using the push buttons to silence the alarm. The pin may be as complex as you would like: my pin was a sequence of 4 single presses.
- The change pin button should prompt the user to enter a new pin when pressed. This pin should be entered by the user via the push buttons and should be saved as the now active pin. Note: this change does not have to survive after an exit of the program.
- Your code should be well commented before turnin.

Likely Python Libraries Needed:

- Tkinter
- os
- time
- GPIO

Hints:

- You'll have to figure out some way of preforming motion detection. Look for python libraries online, this is Linux after all.
- Tkinter works best, (read as: only works), when done within a class structure.
- You're going to need RPi.GPIO to do electronics work. Instructions for importing the library to your Pi can be found here: http://learn.adafruit.com/playing-sounds-and-using-buttons-with-raspberry-pi/install-python-module-rpi-dot-gpio

Extra Credit/Style Points: Make your security pin extremely complex, ie. R+G, B+Y, R, R+Y+G – this meaning multiple buttons being pressed at the same time counting as one entry.

Demonstrations: You will be required to demo your project to your instructor and fellow students during class on March 12th. You may not use slip days to postpone the demonstration, and all team members must be in attendance. The demonstration is worth 25% of your grade for this project.

Team Reviews: By 11:59pm on March 12th, you must provide a letter grade assessment for your teammates. Do not provide a letter grade for yourself. Team reviews, including getting a team review in on time, are worth 25% of your grade for this project.

DUE: All code due via Blackboard on March 12th, by 11:59pm. Team reviews are due via email by March 12th, 11:59pm.