Andrew Valenzuela
Jin Park
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CSCI-246 Pi Project

As someone who is not very well versed in python this project was a little difficult for me. However the alternative was a 10 page research paper so… I chose to do the project.

For the project I used a Raspberry Pi 4 with a camera module. I attempted to use a usb GSM adapter, however Im not sure if there was something wrong with the drivers or the unit itself, but I could not get it to work, it was just never seen by my Pi and after hours of trying everything I could think of I had to make the choice to omit it from my project and the only GSM modem I could find that other people had used successfully would not arrive in time to be of any use to me.

To do most of the hard work I use some pre-made libraries along with the openCV library. The basics of what my program does is to capture an image from the Pi's camera and process it a little to make it easy to compare frames. The first thing I did was to make a JSON config file so I wouldn't have to remember all the arguments that needed to be passed in at runtime like resolution, FPS, ect. All the argument get parsed with the argparse library. After the camera has few seconds to warm up it begins reading video frames in, each frame is sized to 1280x720 then changed to gray scale and blurred. The frames are then converted to a black and white monochromatic scheme and any white sections are grouped together with a contour. If a contoured area is too small(1000) it is ignored, so as to not detect very small things like bugs, otherwise it is detected as movement and a motion counter is incremented, it the minimum number of frames detect movement an image is captured. This is where my neat big problem came in, I can easily capture images from the camera however whenever I tried to capture video either the program would crash or it would just save an empty file to disk. After several days trying to solve the problem with everything I could think of including making new threads to start recording I had to give up on capturing video.

Overall I feel this project was a failure on my part since I could not get the core aspect of video capture to work after motion detection. Perhaps if I was more familiar with python I would have had a better shot at getting it to work, but all I have is a partially work program.