Little Brother

Team Members:

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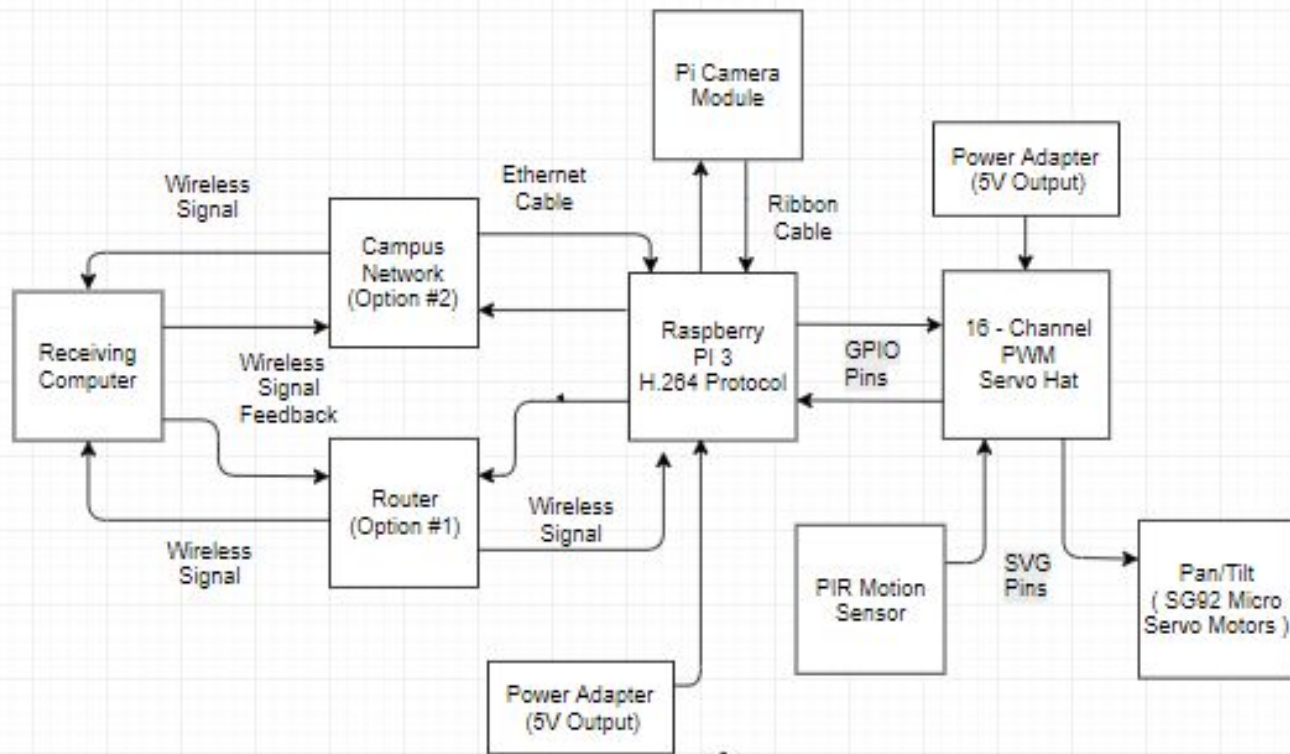Donald Taggart
Michael Vangelista

Project Objective and Concept:

Limited surveillance for student safety on campus

- Virtually no ground level cameras
- Cameras currently only survey a few of the parking lots

- Incorporate a <u>cost-efficient</u> camera system into the Blue light phone emergency kiosk system at the Buffalo State campus
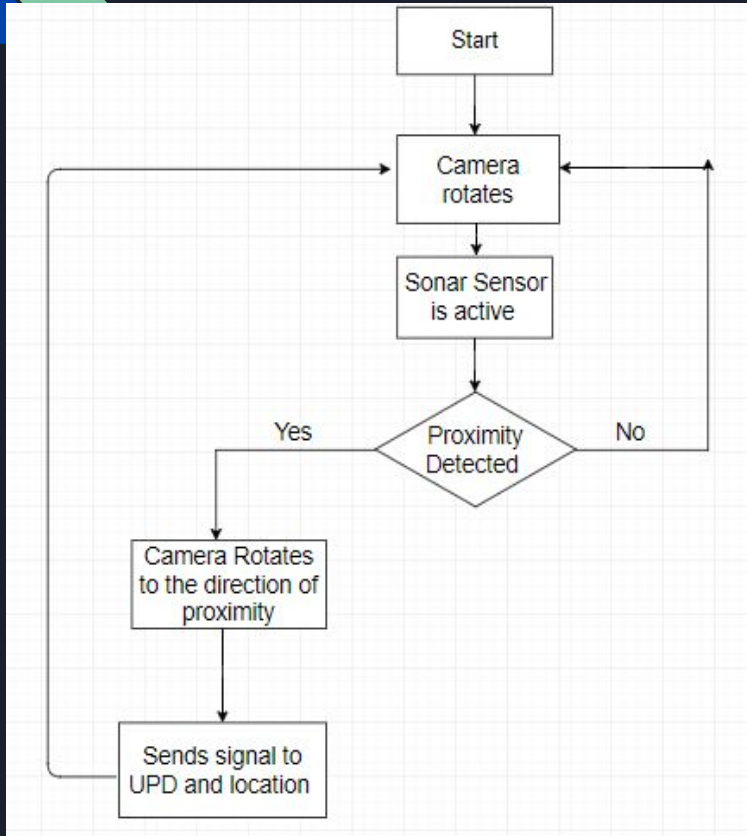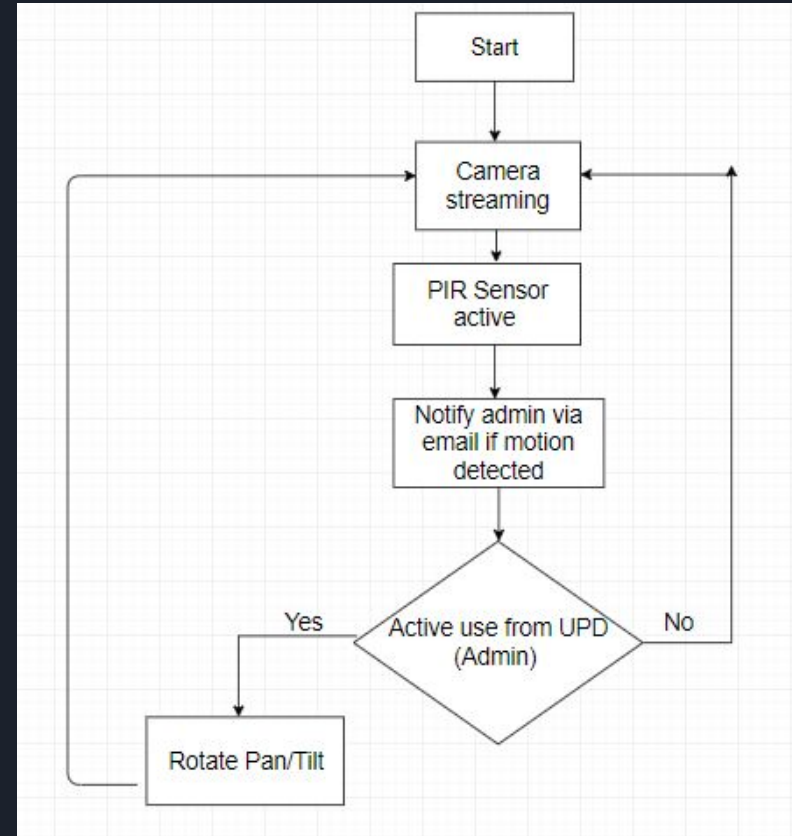- University Police Department

Block Diagram:

Flowcharts

Fall 2017

Start → Camera rotates → Sonar Sensor is active → Proximity Detected

- Yes → Camera Rotates to the direction of proximity → Sends signal to UPD and location
- No → Camera rotates

Spring 2018

Start → Camera streaming → PIR Sensor active → Notify admin via email if motion detected → Active use from UPD (Admin)
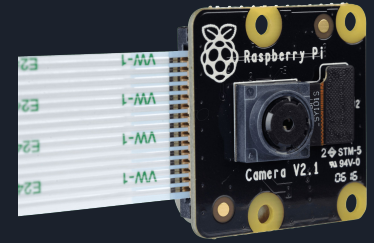
- Yes → Rotate Pan/Tilt
- No → Camera streaming

Components and Their Use:

Pi Camera :

- Raspbian Operating System
- NoIR filter lens
- Low Light photography
- Record/Stream in H.264 Format

Raspberry Pi 3 Model B :

- OS: Raspbian Jessie (Linux)
- Program language : Python 3
- Develop programs using an IDE or Terminal
- 2 Methods under test for video capture:
  - Streaming
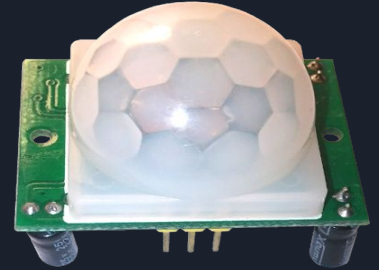 - File Transfering

Pan & Tilt 180 degree Servo Motor :

- Functions by using Pulse Width Modulation.
- Pan and tilts the Pi Camera.

Components Implemented for Spring 2018:

PIR (Passive Infrared) Sensor:

- Detects motion by using infrared signals.
- Used to send an alert to the Little Brother email when motion is detected.

16-Channel Servo HAT for Raspberry Pi:

- Controls the system.
- Prevents damage to Pi from voltage spikes
- Used to provide separate power to drive the servo motor.
- Capable of using up to 16 servo motors for future development

Buffalo State Video Surveillance Policy

- Cameras that will be used on Buffalo State campus by the University Police Department needs to provide additional security for a campus event or situation.
- The video footage must be stored for at least 30 days.
- Must be running 24/7.
- The device is capable of capturing images (but not audio)
- Image capture may use any technological format (H.264 in this case).

Streaming:
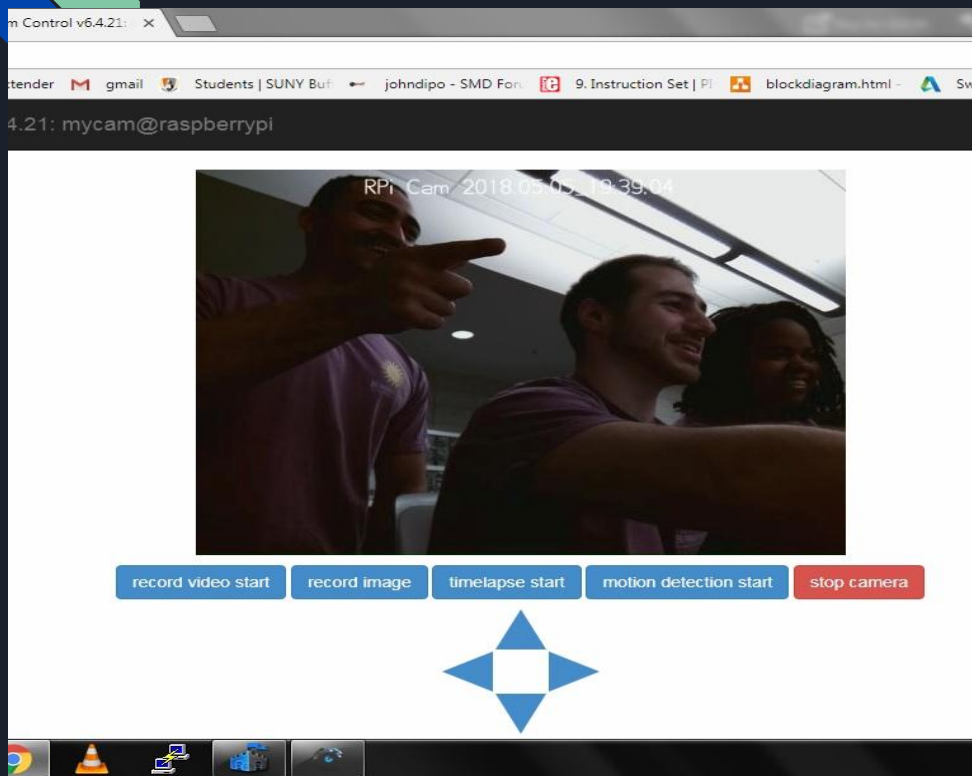
- Live Streaming
- Given Static IP Address
- RTSP Streaming Protocol

Future Development

- Integration
- Network of multiple cameras
- Packaging- Water/weather resistant
- Multiple cameras for 270 or 360 degree coverage