Powerhouse Surveillance

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Project Goal

A modified webcam provides threefold functionality:
- Wake-up on motion detection
- Wake-up from website
- Tracking of faces

http://mypowerhousehome.com
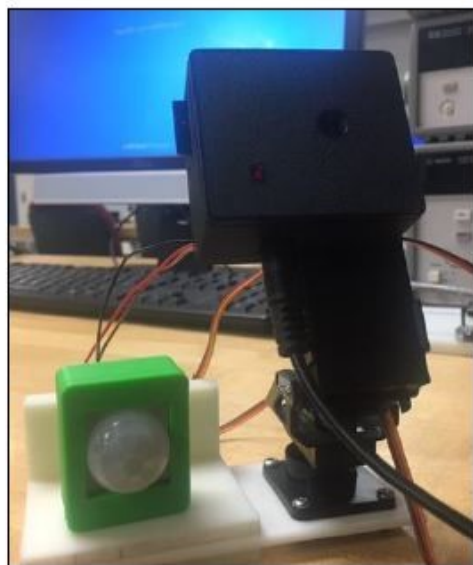
Final Model

Fig. 1. Final embedded PCB design top (top) and bottom (bottom)
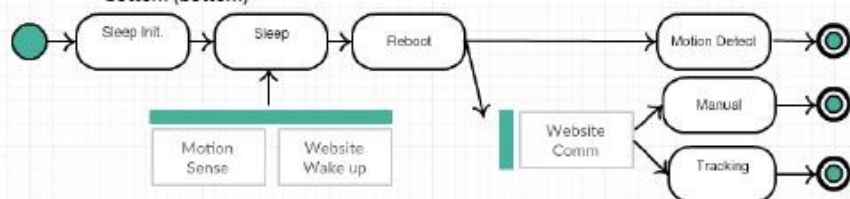

Fig. 2. Picture of Final Model

Fig. 3. Operation Algorithm

Materials

Atmel SAM4S8B, Zentri AMW004 Wallaby WiFi Chip, Omni-Vision OV2640 camera, Raspberry Pi 3, Nginx with Node-Red, PIR Sensor, Adafruit Pan-Tilt with MicroServos, Zortrax 3D Printer (Z-ABS), Python and OpenCV

Learned Material

- Webservers: Nginx, Node-Red, PHP, Python, OpenCV, Websockets and TCP Connections
- Circuitry: Wifi-chip acting as a client, Raspberry Pi
- Supplemental Devices: Servo Motor control and PIR Sensors

Future Work

- Decrease buffer contention and increase frame rate.
- Optimize sleep protocol to minimize power during times of no motion detection.
- Provide an option to store images taken during motion detection as a upgrade to the current surveillance regime
- Switch out the pan-tilt base for a larger base and the servos for ones that can provide more torque to get full range of motion

Acknowledgements