F.I.R.E (Ferguson Intervention Recording Equipment)

Advisors: Prof. Burleson and Prof. Holcomb
Current status

What is functioning:
- Video/audio compressed to record 2.2GB/Hour
- Real Time Clock
- Push-button Camera activation
- AES encryption implemented

What is NOT functioning:
- NFC reader
- Independent activation of camera and mic
- Pre-Record of two minutes
- GPS
- Time-stamp
- MicroSD card mount for additional 16 GB
Current status Block Diagram

Block Diagram (current)

- Camera/Microphone
  - Video and Audio data (compressed)
  - On/Off signal
  - Power

- Local Memory Unit
  - Camera activation signal
  - Power

- Laptop

- Simplified Sensor Array
  - Power
Overview – Camera/Mic Unit

Parts:
• Logitech C270 webcam w/mic
• USB connection instead of ribbon cable with BBB Camera Cape
• Auto-light correction, noise-cancellation and improved gain

Function/Connections:
• Both power and data flow are controlled via USB connection to BBB
• Current software version activates both video and audio upon device trigger

Logitech C270 webcam
Overview – Sensor Array

Design:
• 4-button system with indicator LEDs

Function:
• Button push mimics removal of device from duty belt
• Connection goes high and is sent to GPIO pin on Proto-cape
• Corresponding LED lights up to indicate weapon pull
• Only one device can be triggered at a time
Overview – Local Memory Unit (LMU)

Parts:
• Proto-cape with EEPROM
• Dead-On Real Time Clock Breakout (DS3234)
• GPS Receiver (5Hz, 66 Channel)
• Polymer Lithium battery (3.7V at 2000mAh)

Function/Connections:
• LMU receives weapon pull signal via GPIO pins in proto-cape
• Activates recording via USB connection to camera/mic
• Compresses and stores data into EEPROM with timestamp and GPS information
Overview – Software Component

Parts/Design:
- **BeagleBone Black**
- (1 GHz, 512 MB DDR3L & 4GB eMMC Flash)

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Goals for FPR

- NFC reader calibrated for single device
- 3 push-button sensors for other devices
- 3D-printed enclosures for LMU, camera unit and docking station
- Independent activation of audio and video
- Pre-record option implemented
- GPS- and time-stamped video

Block Diagram (final)