SmartVision
Home Security Through Thermal Imaging

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About our mentor nova coast

- IT & engineering consulting
- Based in Santa Barbara
Working alongside FLIR

- Utilize Lepton
- Thermal imaging company
Everyday Problems

- House fires
- Frozen pipes
- People falling
- Unwanted Guests

Solution: SmartVision
Hardware

Raspberry Pi

Lepton
Technology Stack

- Raspberry Pi
- OpenCV
- MJPG-streamer
- SQLite
- Django
- Bootstrap
- Textbelt
- Mailgun
Demo
Web Application for SmartVision

- Powered by Django MVC Framework
- **Models** abstract the database using Object Relational Mapping (ORM)
- **Views** handle requests from controller and reply with numerous data types including HTML, JSON, and plain text
- **Controllers** map URLs to views using regular expressions
Web Application for SmartVision

- Written in HTML, CSS, and JavaScript
- Bootstrap: positioning, organizing, and content creation
- jQuery UI: increase user interactivity
- iFrame: stream live feed from Lepton
- AJAX: relay settings and retrieve events
Settings/Log Manager

- SQLite wrapper with built-in C functions
- Configuration Thread reads updates from the web app
- Event Threads can write entries into the log table
- Textbelt and Mailgun APIs used to send alerts
Fall Detection

- Background Subtraction: generates a binary image containing pixels belonging to moving objects in the scene.
Temperature Detection

- Communicates with Lepton to enable Radiometry Mode
- Calculate temperatures to values using radiometric formulas
- Thresholds to determine if temperature is outside valid range
People Counting

- Scans the left edge for people.
- Track movement of temperatures to see if people are entering or exiting the frame
Next Steps

- Integrate with IFTTT service
- Smarter home, Safer environment
Thank You