Objectives

- Create a smart-home device platform that is not only cheap and accessible, but also easily integrable with other devices.
- Prototype a device designed to gather and relay data regarding room conditions to the platform’s app server.
- Develop a web-app that can set and modify sensor-dependent control triggers and display data.

Prototype Device

- Raspberry Pi + GPIO and I2C Adafruit sensors
- Drivers written in Python, data sent over MQTT
- Custom PCB board designed for sensor mount

App Server

- Virtualized server with NGINX reverse proxy
- NodeJS & MySQL backend + Let’s Encrypt cert
- Real-time webfeed via WebSocket technology

Current Results and Future Vision

Current Results

- Successfully integrated sensors with the Pi.
- Successfully created web-app for data visualization.
- Successfully implemented software-based “Schmitt Trigger” for control signals.

Future Vision

- Redesign to reduce device footprint and cost.
- Propagate control signals locally from device.
- Add device registration and login authentication.
- Load balancing and integration of MQTT broker into app server to boost responsiveness.

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Questions?

Imaduddin: drivers & sensor integration
Neil: PCB layout, drivers & sensor integration
Austin: frontend
Thorson: frontend, backend, server