1-29-2019, IUPUI

Project Proposal: **IoT Capstone**

Background

Students in academia have varying preference for how loud their study space is. While some people love the chatter of a crowded cafeteria, some prefer to study in as close to absolute silence as is possible. This information up until now however is largely untracked, leaving some students wandering a library for the perfect spot to study.

Objectives

- Create a mesh network of multiple IoT sensor devices which will sense sound intensity and store this information in a cloud server to provide future analytics as well as current sound intensities
- Create a front-end web interface which reports this information to a user base, demonstrating current noise levels in various rooms of a recorded environment, and illustrating historical volume levels of these areas.

Scope

Firstly, the hardware stack will need to be established. This will need be a board which has some sort of condenser microphone to recognize the sound intensity, an onboard networking interface for communications (potentially WiFi if deployed in a library facility), and month long minimum battery life. Following, the software to run on the chip will need to be written, preferably with either the Arduino or MBed API as these exist as the most readily available frameworks. This software will need to sense the sound intensity of its location, and upload this to a data center periodically, and on drastic intensity changes (interrupts). Finally, a web interface will need to be designed which will make sense of the data gathered by providing to the end user a map of all currently recording and previously logged sound intensities, preferably also showing an average intensity based on time of day in a graph. This interface will most likely be established on a software stack of React+Express with a mySQL backend, which is externally updated by the IoT devices.

Timeframe

	Task	Start and End Dates
Phase One	Identify and order hardware stack of 5 sensors	Feb 4 - Feb 8
Phase Two	Develop and debug IoT Device Firmware	Feb 11 - March 1
Phase Three	Develop and debug Web Interface (backend)	March 4 - March 15
Phase Four	Develop and debug Web Interface (frontend)	March 18 - March 29
Phase Five	User Testing Study	April 1
Phase Six	Proposal to IUPUI Library & Negotiations (demonstration)	April 8 - 12

Phase Seven	Deployment and Finalization of all Development	April 15 - May 1

Project Budget

-Cost of all IoT sensors and potentially needed development kit. (~$200)
-Need of web server to host service (Free ; IUPUI provided)

Monitoring and Evaluation

-30 minute weekly progress meetings to demonstrate satisfactory continuation of project
-1 hour sessions demonstrating completion of each phase of project to be scheduled at a future date

Approval Signatures

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