COLLEGE OF SCIENCE
THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

Research and Creative Experience for Undergraduates (RCEU) Summer 2017

Health & Safety Monitoring System

Cailin Simpson, Department of Computer Science
Jason Pohly, Dynetics

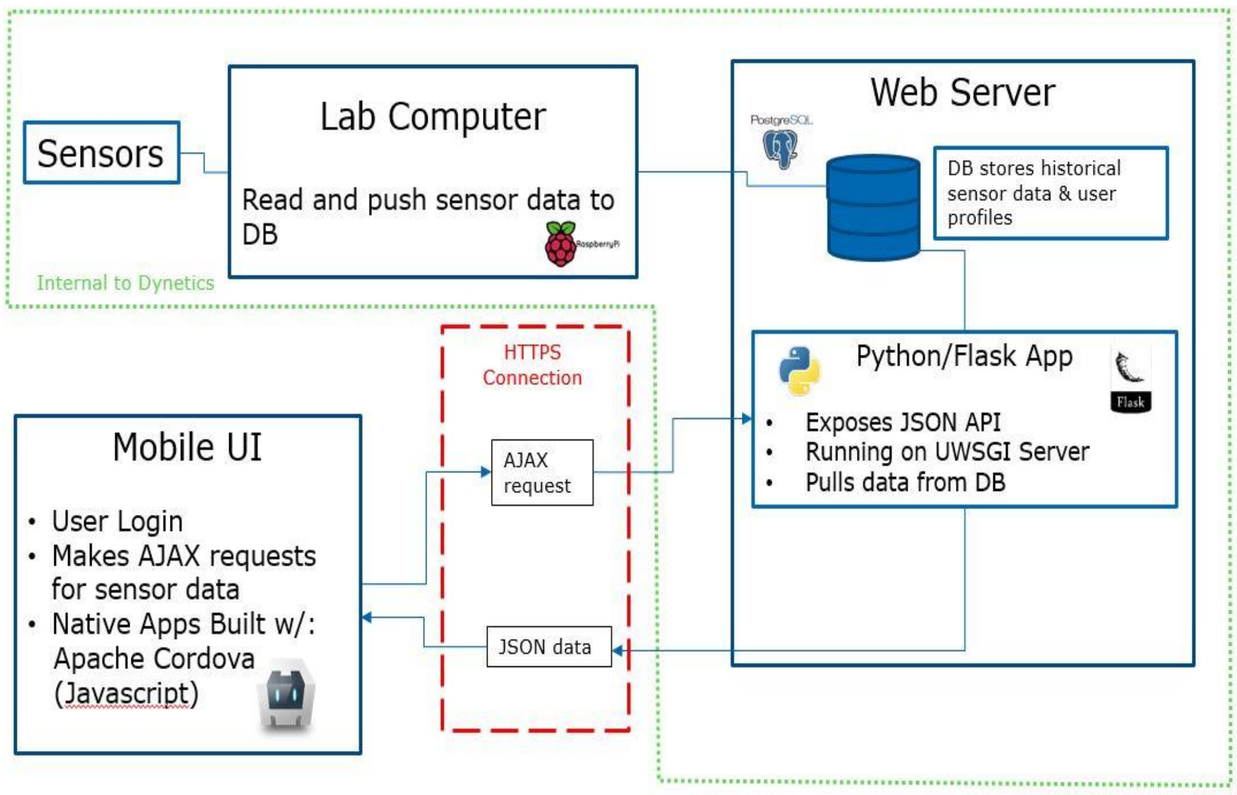
Introduction

The Advanced Materials and Nanosystems (AMN) group of Dynetics has a need to remotely monitor the safety status of material production systems. Nightingale is a web-based mobile application that allows remote monitoring of material production systems. Users have the ability to view the status of systems at any time. Nightingale will push notifications to the users' phones in the event that the systems are not in a safe state.

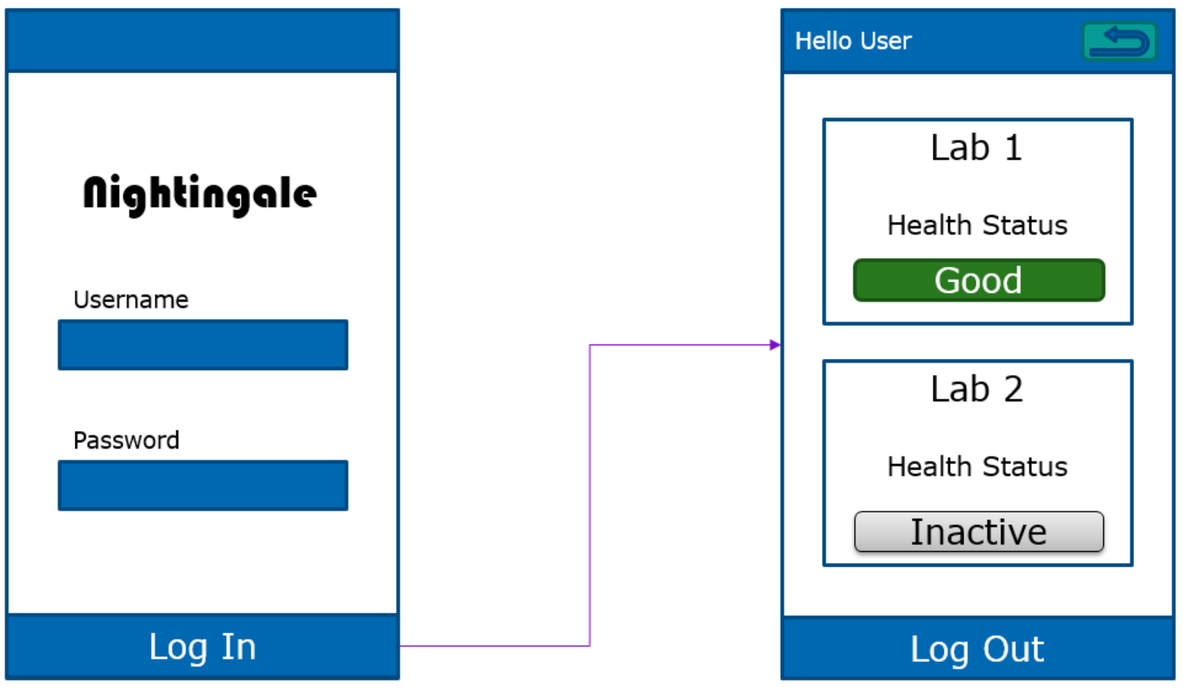
Design

As a result of the AMN group being a research group, our labs change constantly. Nightingale is designed to be portable and deployable on any number of systems. It is also designed to be flexible to changes and intuitive to use.

Nightingale Overall System Design



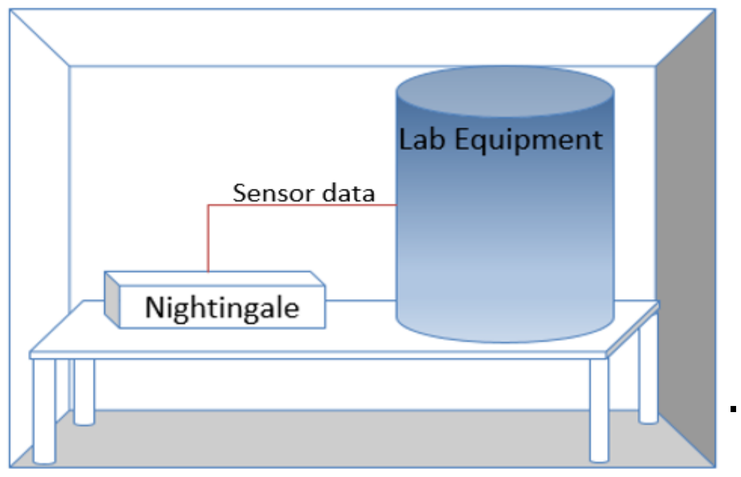
Nightingale Mobile User Interface Design



Materials and Methods

Independent System

Nightingale is a system that is completely independent of the functionality of the equipment in the labs.



.

Frameworks/APIs

Apache Cordova
Bootstrap
Flask/WSGI

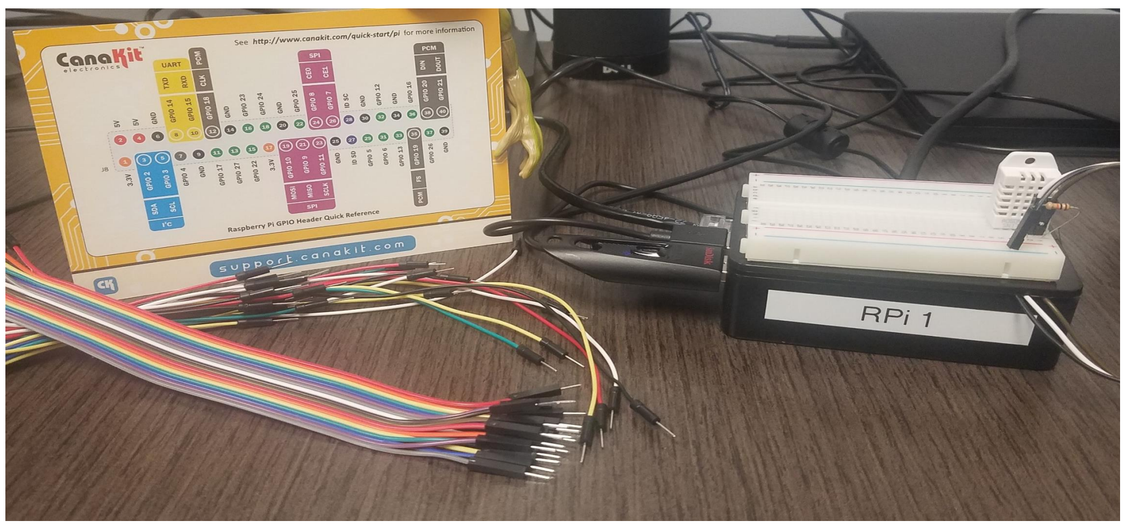
Hardware

Raspberry Pi 2 Model B - Lab Computer

- Memory: 1GB RAM
- Processor: 900MHz quad-core ARM Cortex-A7
- Graphics: VideoCore IV 3D graphics core
- Disk space: 32GB

DHT22 - Temperature and Humidity Sensor

- 3-5V power and I/O
- 2.5mA max current use while requesting data
- 0-100% ± 2-5% humidity reading capability
- -40 to 80℃ ± 0.5℃ temperature reading capability
- 0.5Hz max sampling rate (every 2 seconds)



Impact

Nightingale will expand capabilities of the Advanced Materials and Nanosystems group. The ability to run and monitor material production systems at any time integral to the growth of the group.

Acknowledgements

Sincere thanks to Dynetics, Inc., ALSAMP, the Dean of the College of Science, Office of Provost, President and VP for Research and Economic Development.

ALSAMP
Dynetics