

1 THE TEAM

Team Name: Sensor Network

Team Members: Nick Morley
Jonathan Richards

Technical Advisor: Dr. Hovannes Kulhandjian

Course Instructor: Dr. Reza Raeisi

2 GOAL

- Create a system to collect, transport, analyze, store, and visualize sensor data
- Control external systems manually or automatically according to sensor inputs
- Access user interface anywhere with an internet connection

3 OBJECTIVES

- Build sensor modules built around existing sensors that interface and draw power from the wireless node
- Build wireless nodes that connect to the sensor module over a unified hardware interface. The nodes will form a mesh network to establish communication with the base station
- The base station will interface with the nodes and sensors, both reading sensor values and controlling modules. It will also host the database to store historic data and a server to interface with mobile apps
- The mobile app will allow the user to interface with our system; reading sensors, configuring nodes, and controlling nodes.

4 BACKGROUND

- Microcontroller Programming and Interfacing
- Wireless Communication and Networking
- Data Storage, Processing, and Serving
- Mobile App Development

5 FEASIBILITY

- ESP8266 Microcontroller
 - Economical (\$15 Development Kit)
 - Integrated WiFi

- Interface with multiple sensors
- WiFi Communication
 - Commonly available
 - Use mobile app to configure nodes via WiFi
 - Connect to existing network to access internet
 - Connect mobile device to local network to interface with sensors
- Data Storage, Processing, & Serving
 - Use Raspberry Pi or router running Linux
 - Store sensor data on USB Drive using SQL or similar
 - Perform analytics on data
 - Configure controllers
 - Send data to mobile device for viewing via websockets
- Mobile App Development
 - Do initial setup of sensor
 - View sensor data
 - Configure controllers
 - Connect locally or over the internet through online account

6 APPROVAL

I agree to build the above project throughout ECE 186A and 186B.

_____	_____
<i>Team Member Signature</i>	<i>Date</i>

_____	_____
<i>Team Member Signature</i>	<i>Date</i>

I agree to be the formal, technical advisor to this project.

_____	_____
<i>Technical Advisor Signature</i>	<i>Date</i>

I approve this project to be a viable capstone project.

_____	_____
<i>Course Instructor Signature</i>	<i>Date</i>