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To: Kyle Winfree

Date: 15 February 2018

Subject: Schedule Documentation and Client Contract

Introduction

In this memo, we will be discussing the schedule that my team has come up with for completing the final stage of our Capstone Project. We will be looking into the team dynamic and discussing our new meeting system as well as taking and reporting meeting minutes. This includes our continued communication strategies as well as potential new one.

The Projected Schedule as discussed in the group presentation given last week will be fully laid out, so we can visualize the planning process. Along with this is a Gantt chart of when we plan to complete tasks and milestones including dependencies and broad plans. To conclude there will be an overview of the system requirements discussed with the client and finally what we really plan on accomplishing by the end of the semester.

Project Schedule

See Appendix A for Documentation Schedule and Gantt Chart

In the above figure, the documentation for the project is displayed throughout the semester. This documentation shows various items which we will be providing for the project. For instance, our design reviews which we will be submitting allow us to document our progress and planning for the project's success.

See Appendix B for Project Gantt Chart.

In the Gantt Chart in figure 2 there are a total of 5 subsystems. Each subsystem is a crucial step before the next subsystem in line. As described in the following sections, each section provides a vital piece of the project. Certain systems are dependent upon others; for example, a fully planned hardware subsystem is required to complete the antenna subsystem, due to the variety of antennas in use for different channels. Due to this, our critical path runs through our first two subsystems.

Subsystem 1: Hardware

The first subsystem focuses on the hardware. Researching the different parts and required hardware for antenna systems. For Instance, getting a USB connections or to hardwire the antenna systems to the GPIO pins.

This subsystem is broken down between ordering the parts, finalizing the parts list, contacting the
client and the TA.

Subsystem 2: Antennas

The second subsystem can be started after acquiring the different parts as this subsystem
focuses on the development of the antenna configurations. Firstly for this subsystem, we need to decide which connection requirements we will need for each antenna. Research into the GUI and the networking configuration can be started now but are easier to work on once the antennas and the hardware are completed. This subsystem contingency focuses on the different antennas that can be focused on at different times and isolated from one another, which would allow us to divide the work amongst which antennas have precedence. This allows the team to move around the timeline for the antennas as need while still meeting being able to meet our deadline.

Subsystem 3: Network Software

The third subsystem is centered around the software that connects each node and performs the networking tasks on the nodes. This operates the antenna subsystem, allowing for the data that is transferred to be properly received by the Raspberry Pi. This subsystem must allow for all antennas to be used to send and receive data. This will be set by the configuration software in the following system.

Subsystem 4: Configuration Software

The final subsystem focuses on software which configures the network and prepares the networking software. This is sent to all nodes in order to operate on the same channel, which will then limit the required work to switch antennas during use. This allows the system to be highly configurable, allowing for more ease of use.

Communication Strategies

A majority of our communication as a team will be down through the Slack app. Everyone in the team has each other's contact information in case the Slack app is not working, or someone is not responding. The Slack app also allows us to communicate with our TA's. For our TA's and our Client, the team first sends a formal email with an introduction and the main focus of the email. There currently is no meet up times with our TA and Client but those are in the works. The team meetings are scheduled for Wednesdays 12:20-1:20. If needed the team can meet up on Mondays around the same time, otherwise it will either be after 6 on any given day depending on schedules that week.

Mentor Meetings

After discussing meeting times with our GTA, Arnau, we decided upon Mondays from 1:00 to 1:30. Given our very busy schedules, not all members will be present at all meetings, and in worst cases, meetings with Arnau may be conducted via email. These meetings will be conducted weekly to review our project plans and progress throughout the class. These meetings will also provide us with chances to review parts orders with our GTA before ordering from Kyla.

Client Requirements

Here is a list of requirements from the original proposal that have been modified after discussing the project further with the client.

- To have at least 3 Raspberry Pi's communicating with each other on battery power.
- To have communication across FM, Zigbee, Wifi AP, Wifi Mesh, Bluetooth, and LoRa channels.
- To allow a program of their choice to communicate through each of the different channels.
- To allow for multiple channels to be run on a single PI
- To allow for the network architecture to be configured via a setup JSON file
- To allow for the antennas on each device to be set up via a JSON file.
- To connect to a single PI and to be displayed additional information
- To allow a network to be configured from a laptop computer running a Unix OS.
- To create an API which allows for the addition of other antennas.
- The entire setup needs to be mobile enough to be in a backpack.

Each of the requirements falls within one of the four subsystems allowing us to easily split each task as shown in figure 1.

Conclusion

In the end many of the parameters are similar to those discussed in the previous semester. Our team will meet when we need to and use the same types of communication strategies of slack and
email because that is what works best for us.

The project is broken down into planning, development, and conclusion phases which each have subsections addressing the needs and events that will occur throughout the semester. These are subject to change, but the team will try to stick to these guidelines. First, we must meet up and compare the different schedules and Gantt charts we have created. Between the four of us I'm sure we have slight variations of how this semester will go but for the most part it will be the same. When we decide on actual dates we can but those together and submit the final group documentation of the schedule.

Sincerely,

Wireless Mesh Grid Capstone Team

Hannah Caldwell-Meurer, Ryan Hitt,
Jack Garrard, Cody Roberts

Appendix A

Appendix B

Name	Begin date	End date
Meeting Min...	4/8/19	4/8/19
Meeting Min...	4/9/19	4/9/19
Peer Evalua...	5/2/19	5/3/19
Peer Evalua...	5/6/19	5/6/19
DR4	4/29/19	5/3/19
DR4 Due	5/6/19	5/6/19
Hardware	1/18/19	2/25/19
Order 2 Ra...	1/18/19	1/18/19
Order 1 Ra...	2/4/19	2/8/19
Find Battery	2/11/19	2/18/19
Order Battery	2/19/19	2/25/19
Antenna	1/29/19	2/25/19
Order FM R...	1/29/19	2/4/19
Order Zigb...	2/5/19	2/15/19
Order LoRa...	2/5/19	2/15/19
Create Gen...	2/19/19	2/25/19
Networking Sof...	2/11/19	3/13/19
Layout Prog...	2/11/19	2/15/19
Program Ba...	2/18/19	2/22/19
Program Bl...	2/25/19	2/26/19
Program De...	2/20/19	2/26/19
Test Blueto...	2/27/19	2/28/19
Program Wifi	2/27/19	3/1/19
Program FM...	2/27/19	3/1/19
Test 3 Pis	2/28/19	3/1/19
Test Wifi	3/4/19	3/5/19
Test FM	3/4/19	3/5/19
Program Wi...	3/4/19	3/6/19
Program Zi...	3/4/19	3/6/19
Test Wifi M...	3/7/19	3/8/19
Test Zigbee	3/7/19	3/8/19
Program LoRa	3/7/19	3/11/19
Test LoRa	3/12/19	3/13/19
Configuration S...	2/18/19	3/15/19
Layout Conf...	2/18/19	2/22/19
Program Co...	2/25/19	3/1/19
Test with 2 ...	3/4/19	3/5/19
Test with all...	3/6/19	3/8/19
Test all ant...	3/14/19	3/15/19