Project Status Report 3/5/20

Status Items to Report	R	Y	G
Schedule			X
Budget			X
Quality			X
Team Dynamics		X	
Client Reactions			X

Nikolai

2/19/20

Get the mesh network communication working on the Adafruit Feathers without requiring EEPROM.

First step was to find out how to obtain a unique identifier on the Feather M0's.

There was the possibility of a MAC address on the Radio, LoRa serial number or the SAMD21 processor having an ID. Found a library that can extract this value and display it on serial output.

```
UniqueID: 15 98 F4 AD 50 52 51 51 32 2E 31 20 FF 0D 13 3B
UniqueID: 32 2E 31 20 FF 0D 13 3B
```

From here I hard coded the first byte in the radio sending test and assigned an ID of 1 or 2 to the two Feathers that I have for simplicity. Once the others come in, they will be assigned 3 – 7.

```
This LoRa radio ID is 1
Arduino LoRa RX Test!
LoRa radio init OK!
Set Freq to: 915.00
Received:
48 65 6C 6C 6F 20 57 6F 72 6C 64 20 23 30 0 20
20 20 20 0
Got: Hello World #0
RSSI: -8
Sent a reply

This LoRa radio ID is 2
Arduino LoRa TX Test!
LoRa radio init OK!
Set Freq to: 915.00
Sending to rf95_server
Sending Hello World #0
Sending...
Waiting for packet to complete...
Waiting for reply...
Got reply: And hello back to you
RSSI: -11
```

Next step is to have the Feathers go to sleep and then wake up on a timer to send a message.

This will be more difficult to debug since the serial port to the monitor gets disabled upon sleep and doesn't get reestablished upon waking. I plan to use the built in LED to blink several times depending on whether it is sending or has received a message.

3/5/20

- Have split up the networking portion of the software into smaller components and prioritized them based on what we absolutely need and what would be considered nice to haves
- Have assembled the Feathers and attached antennas
- Received the DS3231 RTC's and the batteries
- Will be working on getting the GSU to wake up on a timer from the DS3231, make the GSM go to sleep on a timer and wake up periodically to receive messages
- Will simulate the GSG with one of the Feathers so that we can do a demo of the entire system before/after Spring break (if we haven't received the gateway yet, otherwise it will be done with the gateway)
- Use the ID that is now being generated as a way to use addressing for LoRa messages

Tyrel
2/19/20

- Working on interfacing simulated data into unity so that unity can depict which spot is full.

- The garage structure isn't done yet in Unity, but I figured I should make sure I can figure out how to send and receive the data how I want.

- The order for the clocks and batteries have been placed, but I haven't heard on a delivery date at this time. I am supposed to follow up with Carrie today.

- The boards should all be at the den. But again, I am following up with Carrie when I get there.

3/5/20

- Working on interfacing Python with unity. It is difficult because python does not have a direct call to C#.
- The python script that simulates cars arriving will ultimately generate messages for the gateway to "receive." I need to then take the messages received and write some code to inject data into the unity environment. I have been trying to do all that in python, but I might change that part of the code into c# somehow. That is the piece I need to figure out right now.
- Will take on tasks that were going to be assigned to Joel if he ends up dropping – the VNC and working on the gateway
- Ordering the gateway, had been discussing it with John

Zane

2/19/20

- Transfer code from Pro Mini Arduino over to MKR board (it has the same processor as the Feather that we will ultimately be using).
- revisit efficiency/power saving routines to further optimize battery life.
- Modify the PIR and Ultrasonic sensors to remove any unnecessary components that hinder battery life. There are lots of tutorials online about how to do this, as well as convert the sensors from 5v logic to 3v.
- Work with Nikolai to visualize total power consumption of the system, and begin putting together a display for 1 year battery life requirements. We will be using smaller batteries, so I need to show that if we changed out the batteries to <specific capacity> that the system would last for one year.
- Finalize the enclosure. I need to print the final enclosure, prep, paint and weatherize it, and figure out how the components will be situated inside.

3/5/20

- Has received 2 Feathers to build into full-fledged GSU's
- Will be putting the Arduino sketch that Nikolai has created on Github and add the sensing portion of the software
- Going to start assembling enclosures

- Ordering filament for 3D printing
- Had been having issues with 5V version of sensors and will order 3.3V ones instead

Joel

Is currently MIA.

Tasks that he was working on/was going to be assigned.

- Wiki page
- VNC
- The gateway and server
- Encryption of LoRa messages