



ECE 477 FINAL REVIEW: TEAM 6

OUTLINE

- Project Overview
- Block Diagram
- Design Challenges
- Individual Contributions
- Project Demonstration
- Questions



PROJECT OVERVIEW

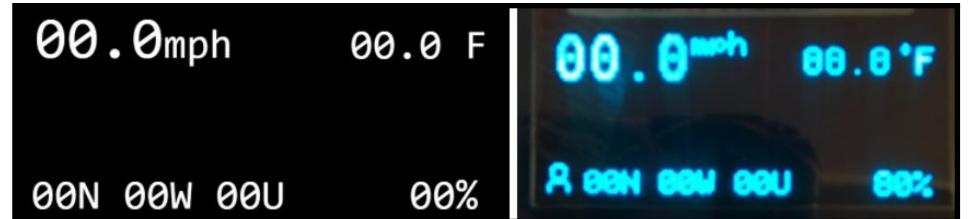
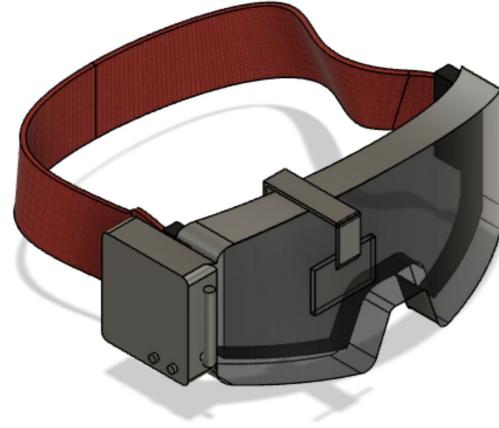
SHOW-WEAR GOGGLES *AUGMENTED REALITY SNOWSPORT GOGGLES*

Hands-free access to performance and device metrics via Transparent Display

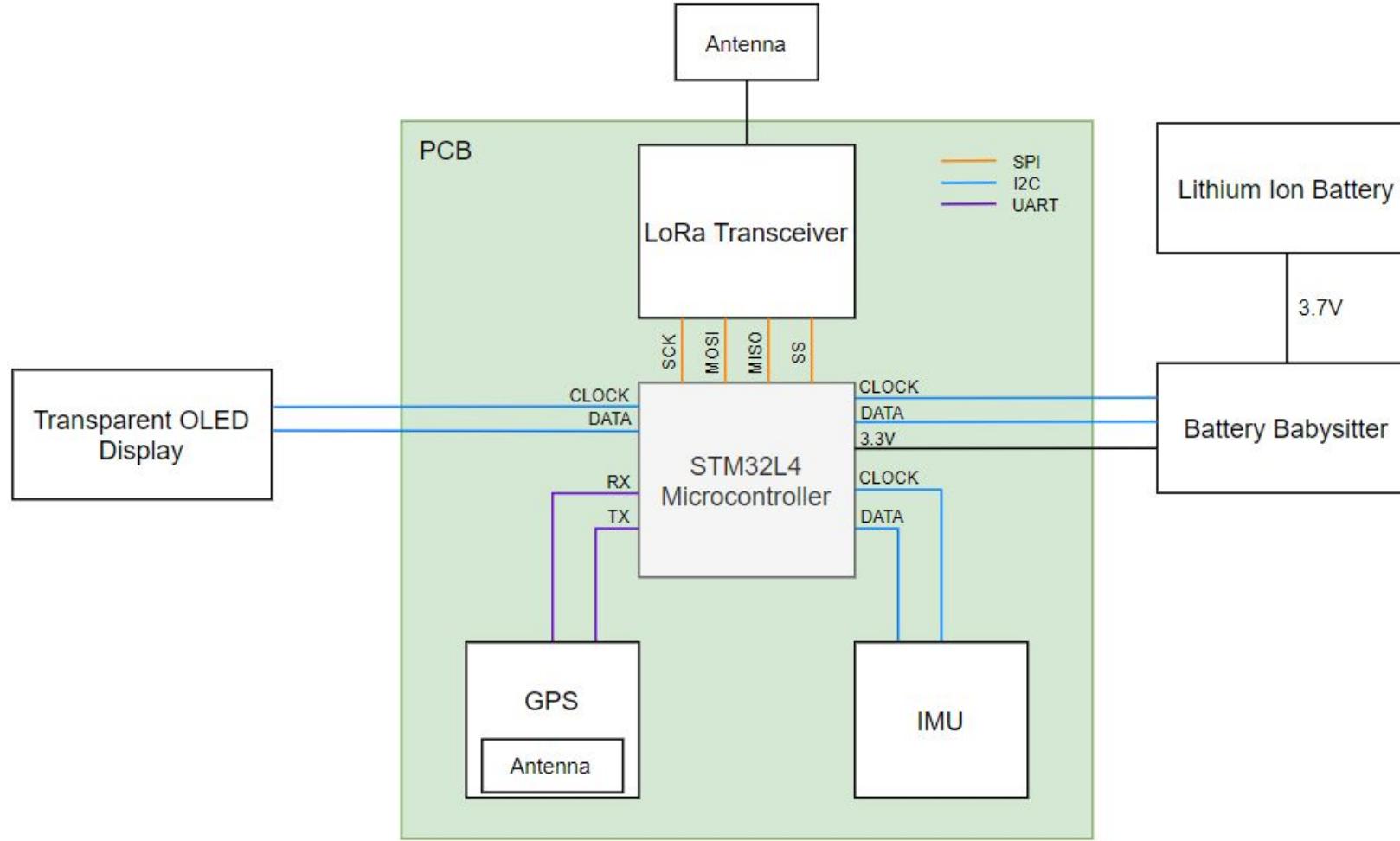
GPS capable with Buddy Location Finder feature

Long Range (LoRa) Radio support

For Snowsport Enthusiasts of All Skill Levels



BLOCK DIAGRAM



DESIGN CHALLENGES

PCB Construction

Lack of Soldering Experience and Expertise

Battery Power

Ineffective Current Draw

Velocity Calculation

Accelerometer Drift

LoRa Integration

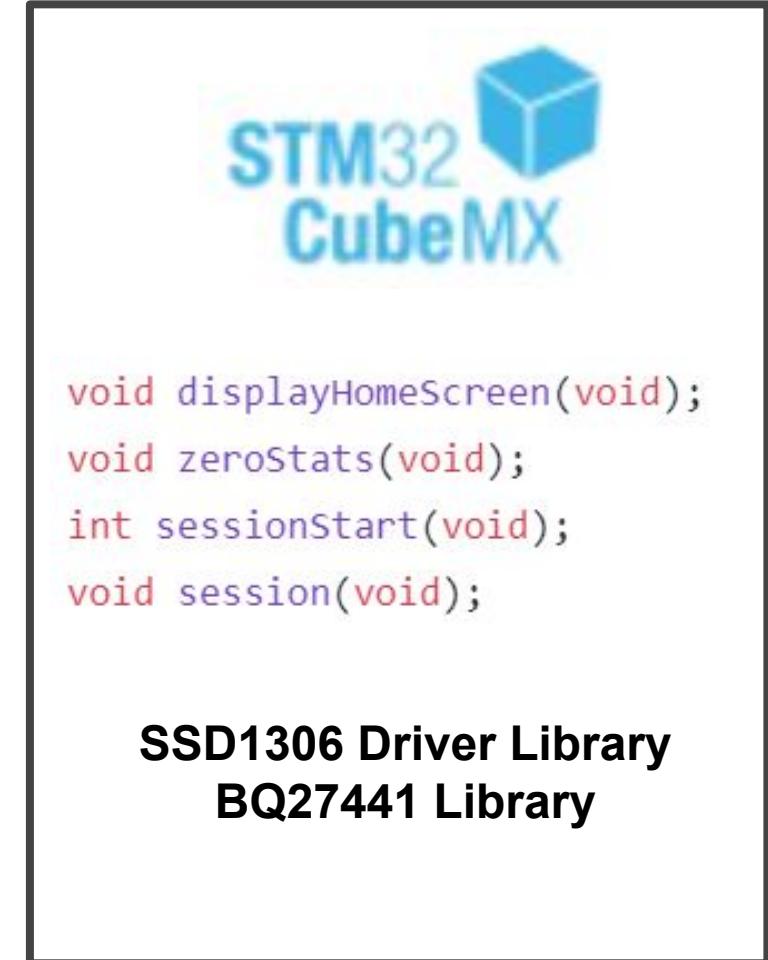
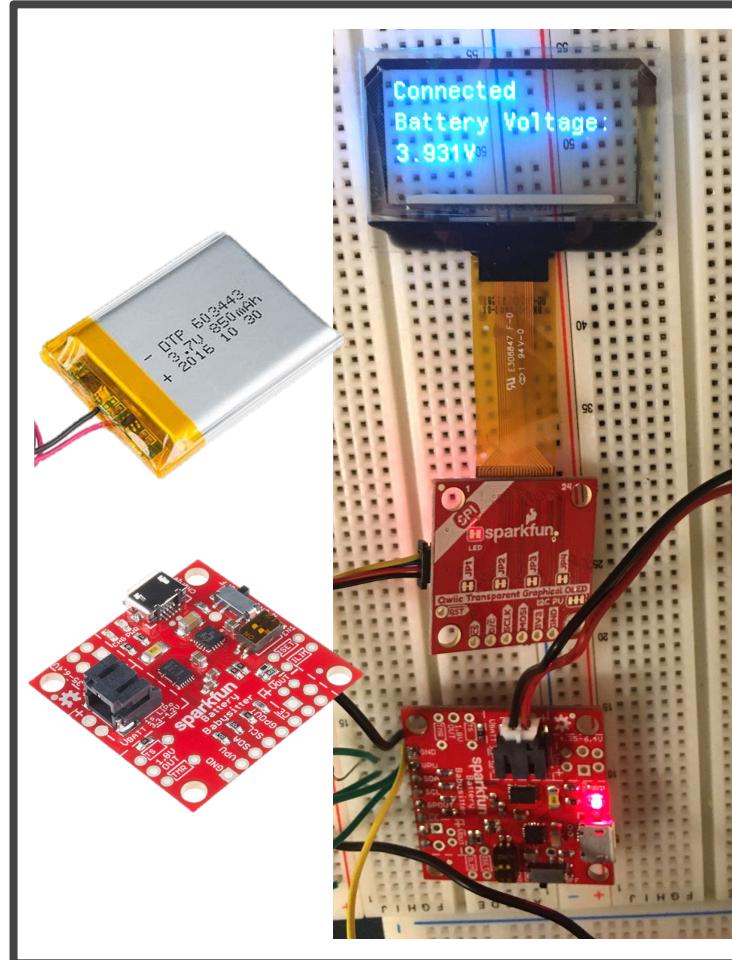
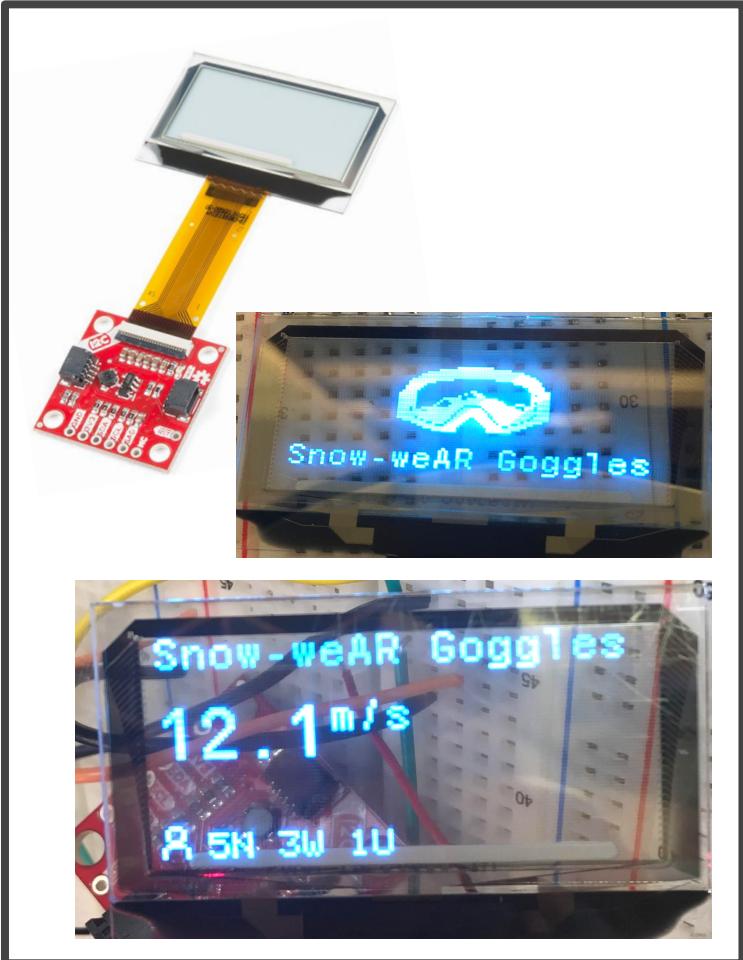
Interrupt, Clocking, and Timer interference

Manufacturing

Streamlined Goggle Design not attained

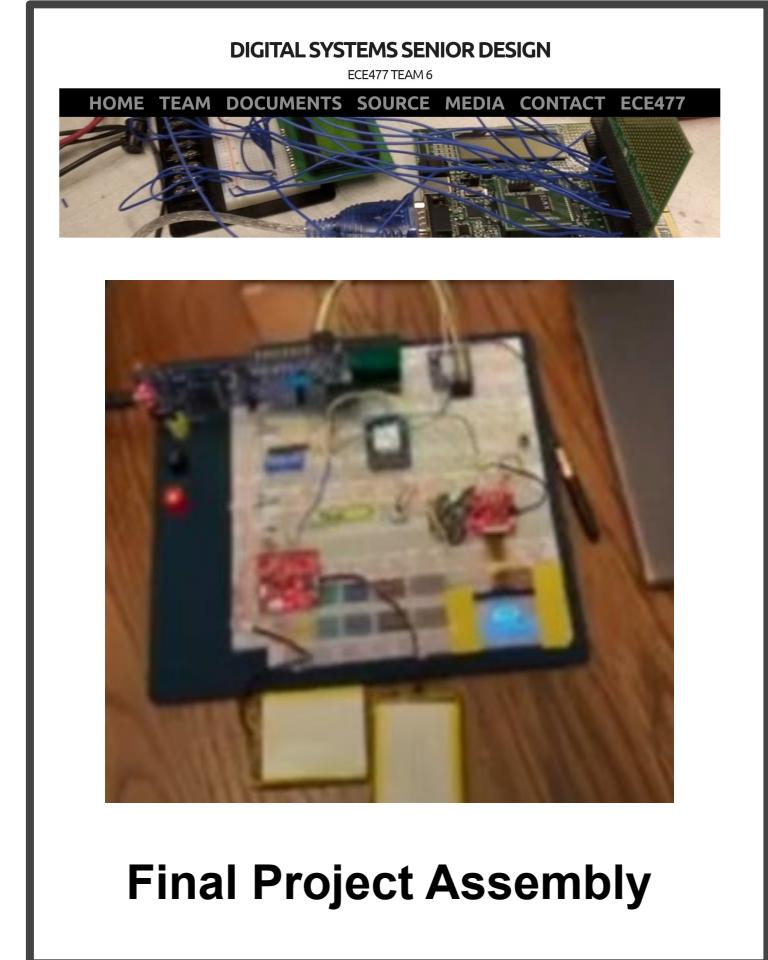
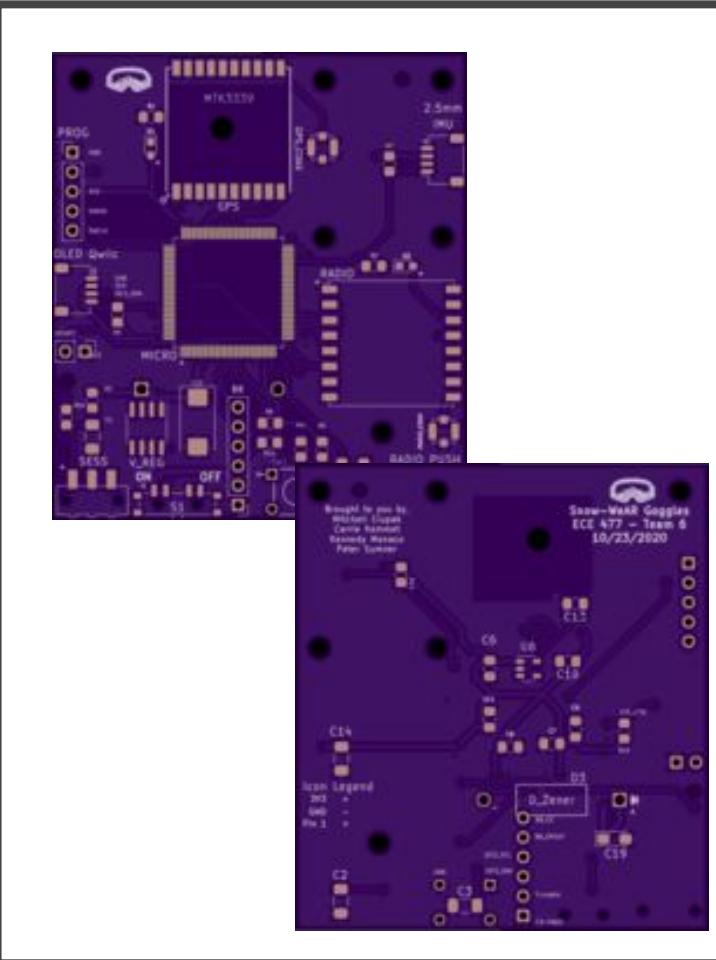
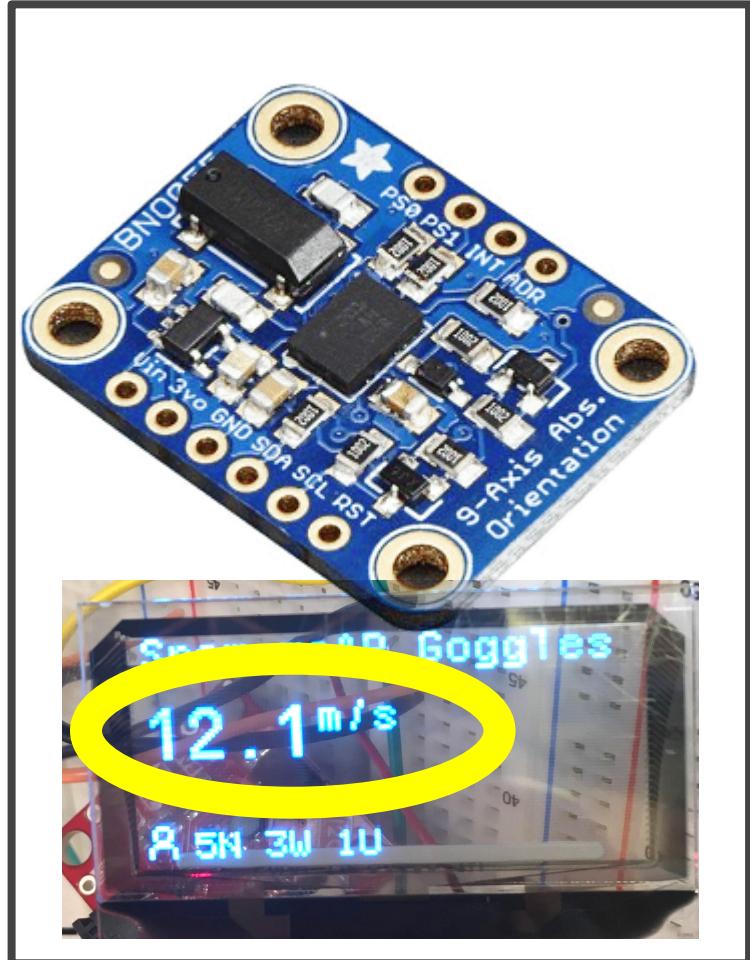
INDIVIDUAL CONTRIBUTIONS

Kennedy Monaco - Team Leader



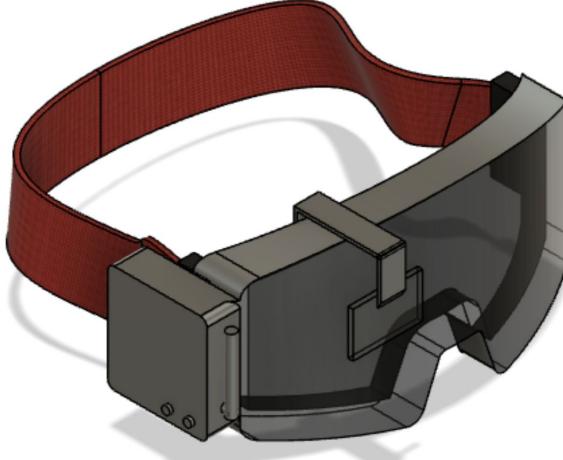
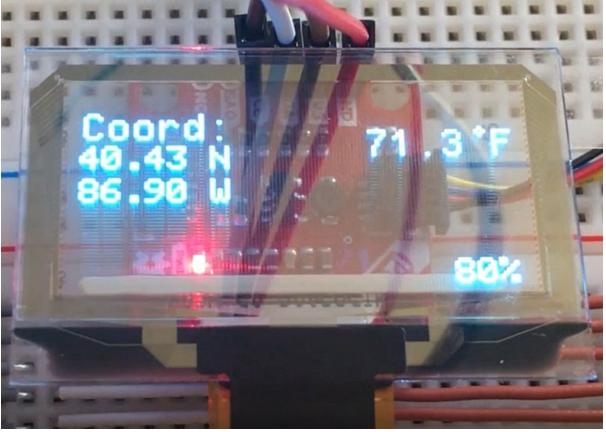
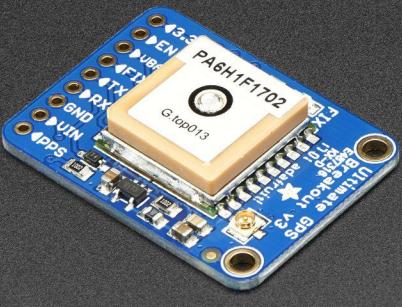
INDIVIDUAL CONTRIBUTIONS

Mitchell Clupak - Systems Engineer



INDIVIDUAL CONTRIBUTIONS

Peter Sumner - Software Engineer



CAD Model



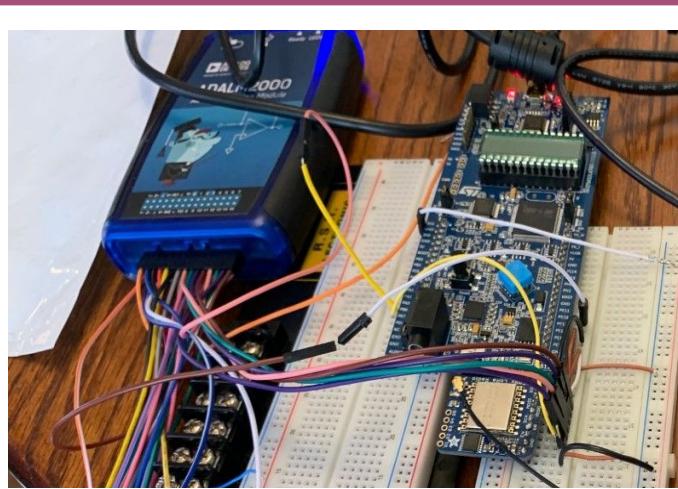
Final Project

INDIVIDUAL CONTRIBUTIONS

Carrie Kommet - Hardware Engineer

RFM95W Library

```
int LoRa_Init(void);
void loraTransmit(uint8_t
*buffer, uint8_t len);
void loraReceiveModeInit(void);
void loraReceiveGPSData(uint8_t
* buf);
```



Contributions

- LoRa library and integration
 - Developed custom SPI and SX1276 libraries
 - Created reliable communication interface
- Timer/Interrupt scheduling
- Initial schematic design
- Hardware system integration and limitations

PROJECT DEMONSTRATION

1. An ability to operate for 5 hours at 0 degrees Fahrenheit.
2. An ability to estimate battery level with 10% tolerance.
3. An ability to report speed using an IMU sensor.
4. An ability to send and receive GPS location data via radio chipset between devices.
5. An ability to toggle relevant user information on an OLED display.

Questions?