SmartSeat

A Digitally-Smart Car Seat

Computer Systems Design Laboratory
University of Kansas
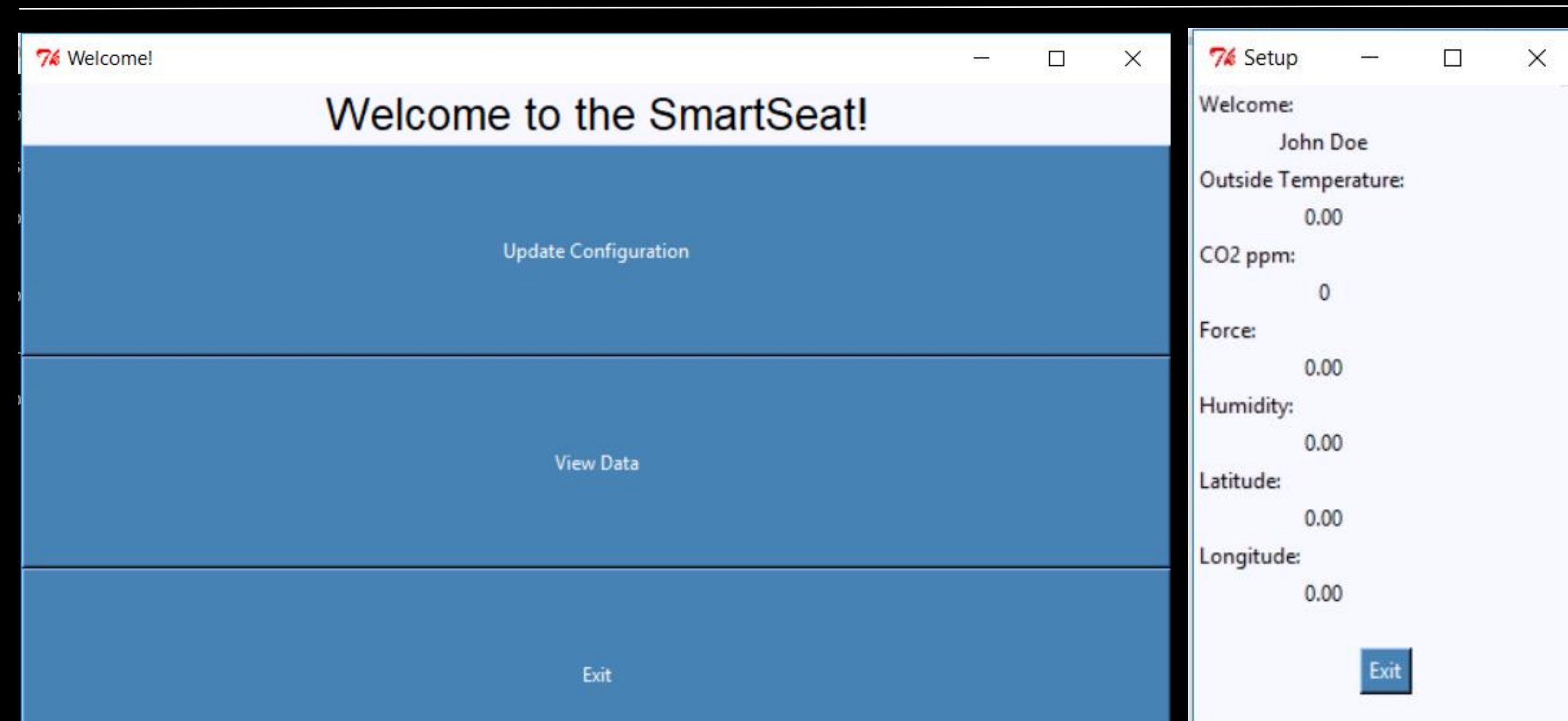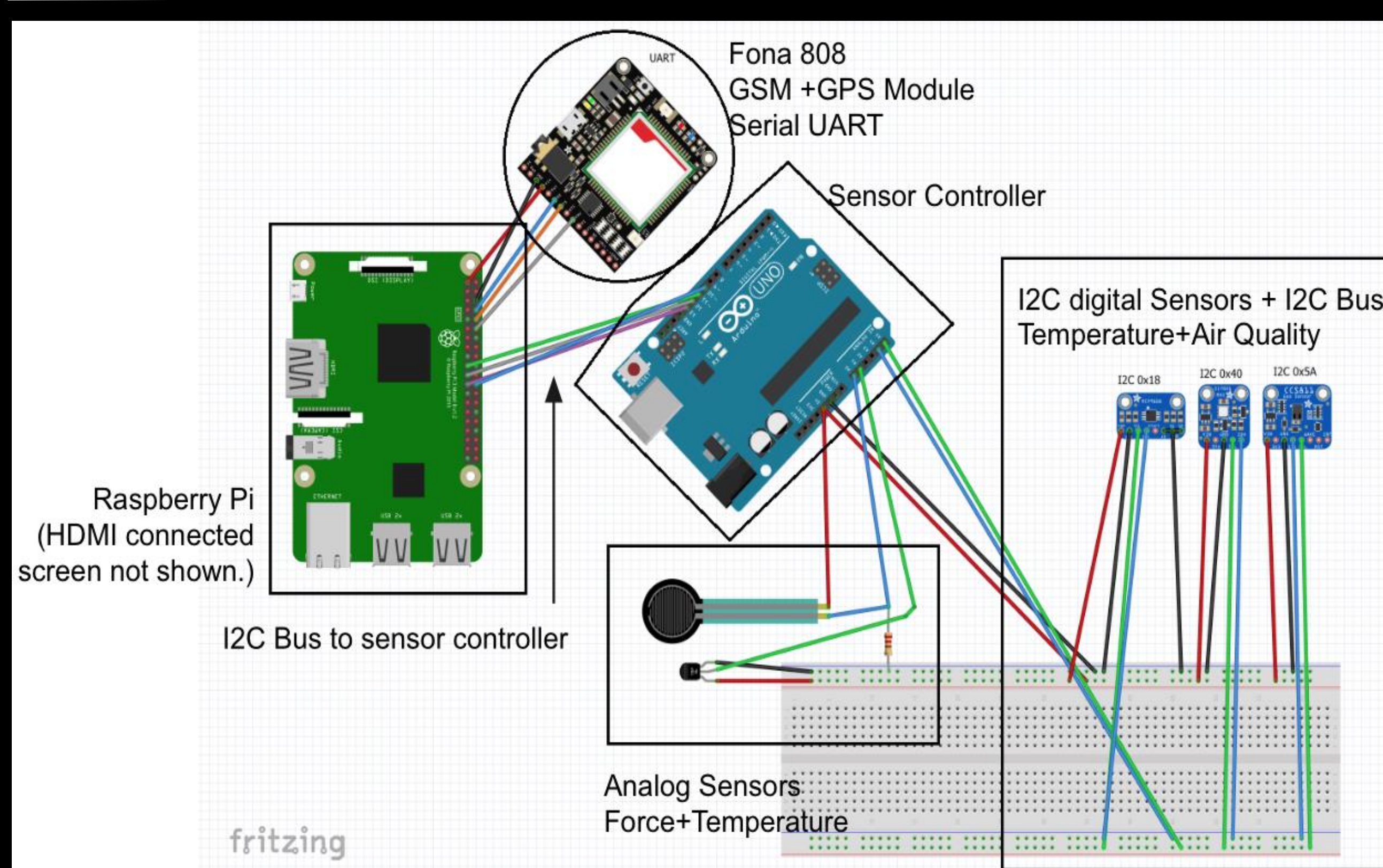
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Results & Summary

We were able to create a safe and functional smart car seat. SmartSeat can detect when an infant is in trouble through redundant and accurate temperature, humidity, and air-quality sensors. When SmartSeat senses the danger it sends out a text to the guardian and ICE contacts. The warning text includes SmartSeat's GPS coordinates along with the sensor data. With safety being our highest priority we even used a Lithium Iron Phosphate battery because of its stable properties.
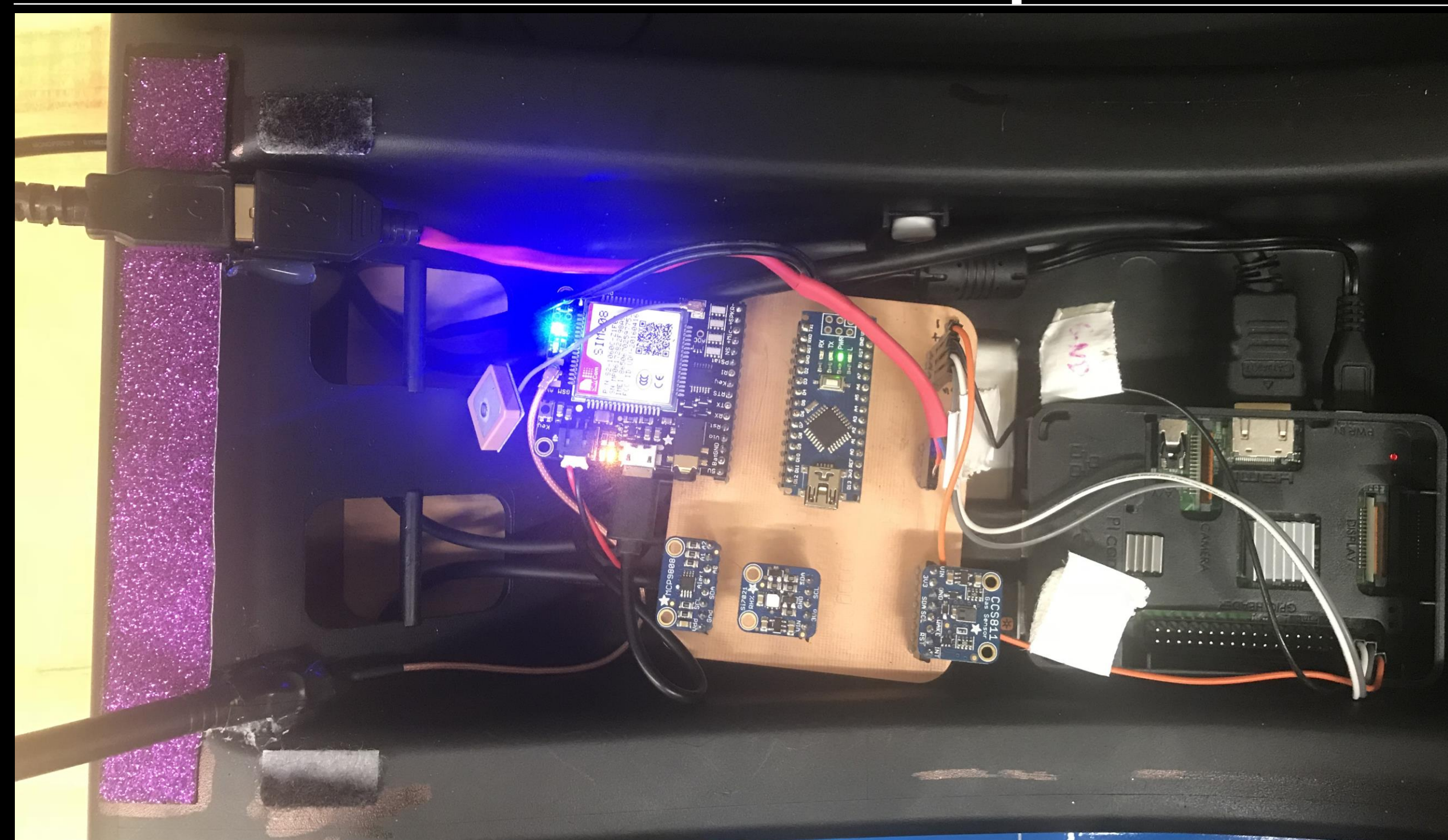
GUI

Prototype Layout

Fona 808
GSM +GPS Module
Serial UART

Sensor Controller

I2C digital Sensors + I2C Bus
Temperature+Air Quality

I2C 0x18   I2C 0x40   I2C 0x5A

Raspberry Pi
(HDMI connected
screen not shown.)

I2C Bus to sensor controller

Analog Sensors:
Force+Temperature

fritzing

The Team

Chris Bernosky, Zachary Austin Gilchrist, Zackery Mryyan, & Michael Navickas.

Sensors PCB & Microprossesors

Objectives & Purpose

Our purpose for this project came from a 2017 CNN article about how infants are passing away each year when left in cars, and there isn't an apparent solution. We wanted to create a car seat capable of communicating for the baby when they're facing uninhabitable conditions. The car seat monitors the Temperature, Humidity, and Air quality and notifiys the guardian and I.C.E. contact.

In order to achieve this we needed to create a car seat capable of,

- Reading GPS data
- Being able to send and receive SMS messages via GSM
- Configuring the ADC converter for the temperature and force sensors
- Reading and writing to SD for storing ICE contacts and such
- Selecting an appropriate backup power supply to power the modules when the car is off

Portrait View of Touch Screen