

Huarui



Pablo



Will



Jordan



Stay Alert Heat Monitor

Members: Pablo, Will and Huarui

Mentor: Jordan

Our Problem:

- For parents, guardians, pet owners, and care providers, it is hard to remember that a pet or child is in the car and could be exposed to extreme conditions because of outside distractions.

The theme was:
"Tune In"

- "Tuning in" to an issue that we hear about in the news
- Bringing awareness to the danger of leaving children and pets in cars unsupervised



History and Context

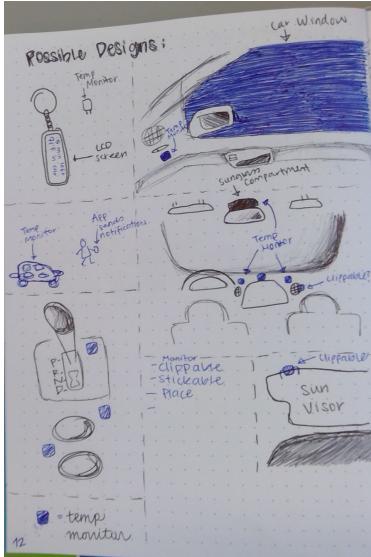
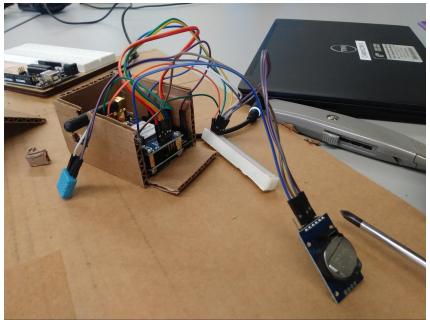
- Outside temperature of 61° F can reach more than 105° F in an hour, exceeding internal body temperature for heat stroke in children



- Unsafe car temp claims life of more than 37 children
 - In more than half, child was forgotten
 - Other half, the adult knew where the child was
- Dogs are more likely than children to be left in cars and can be more sensitive to heat as well



Design Process



Prototypes



- Small, lightweight, portable, and functional
 - Holes in case to prevent overheating
 - Holes for Arduino parts and SIM shield
- Enclosure is made of wood to minimize overheating

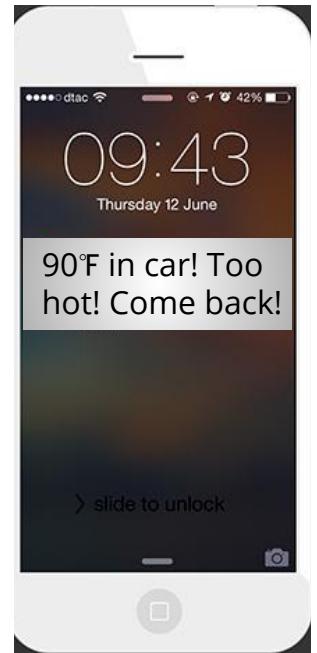


Solution Requirements and Goals

Minimum: A notification system that sends SMS to the user's phone based on internal temperature of their car.

Realistic: A temperature-activated SIM shield that sends SMS to the user's phone.

Reach: Fan, keychain; an alternative to mobile phone, how car A/C is hooked up to the car using the Arduino



Team Roles

Structural Lead: Huarui

- Arduino case and design

Electrical Lead: Pablo

- Soldering and wiring

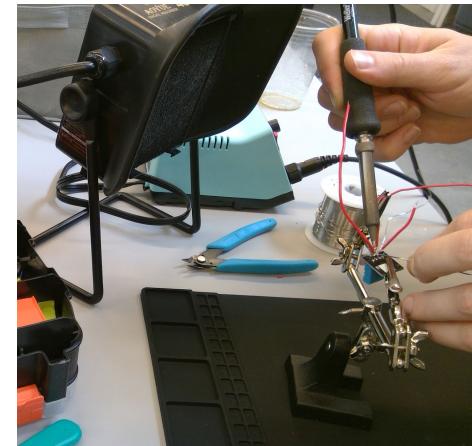
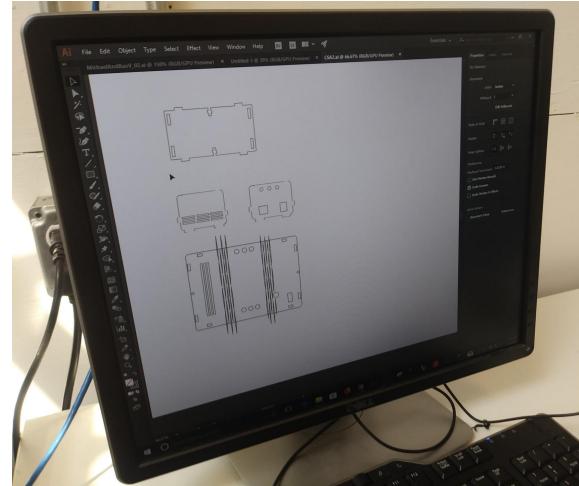
Programming Lead: Will

- Arduino code: Temperature sensor, clock, SIM shield, LCD screen, and buzzer

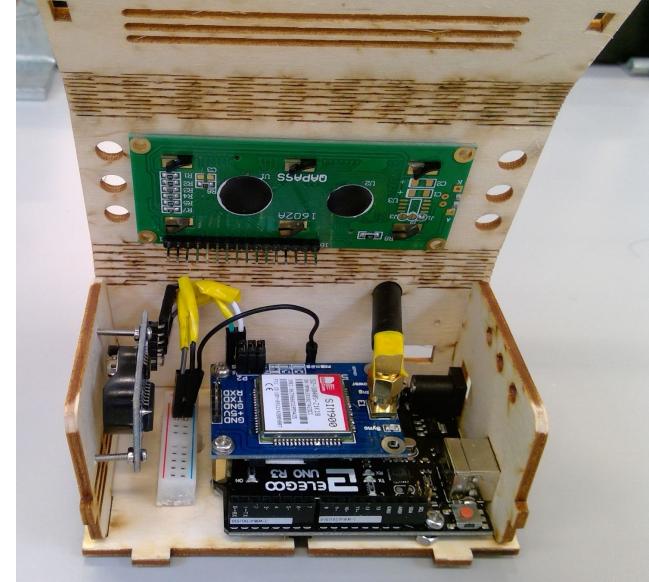
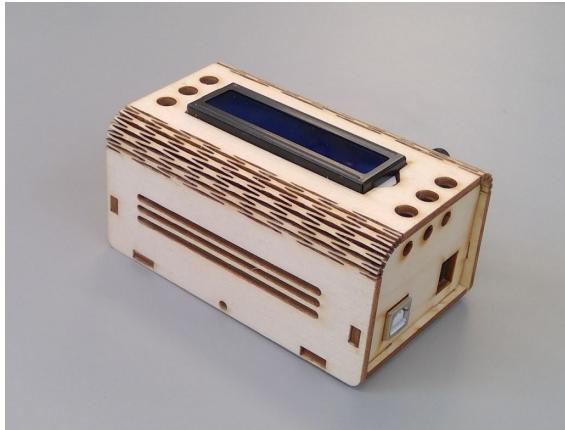
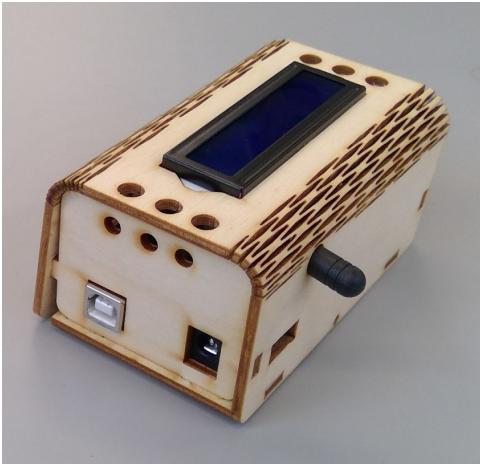


Techniques and Tools

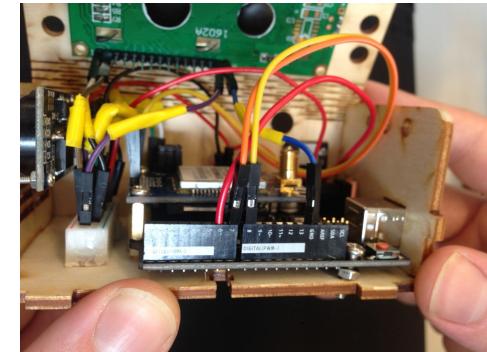
- Adobe Illustrator
- Laser Cutter
- Programming
- Arduino Create
- Soldering Iron



Final Product:



- Attachable to the interior of a car
- Reads temperature using DHT sensor
- Sends SMS message once car is too hot
- LCD screen displays temperature



Challenges:

- GSM/SIM Card: We didn't have the right code at first, so the SIM card shield (the thing that allows us to text using the Arduino), wasn't sending messages and working with our code.
- Using the right libraries: Libraries allow you to bypass long hours of coding by importing it. Certain ones wouldn't work with each other, or would be overly complicated.

```
#include <Wire.h>           //Clock Library
#include "DHT.h"             //(DHT)Temp+Humidity Library
#include <LiquidCrystal.h>    //LCD Display Library
#include <SoftwareSerial.h>   //

#define DS3231_I2C_ADDRESS 0x68
#define DHTPIN 6 //DHT Pin
#define DHTTYPE DHT11 //DHT Type

DHT dht(DHTPIN, DHTTYPE);

const int rs = 4, en = 5, d4 = 10, d5 = 11, d6 = 12, d7 = 13;
int brightPin = 3;
int brightness = 100;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
SoftwareSerial SIM900(7, 8);

byte second, minute, hour, dayOfWeek, dayOfMonth, month, year;
byte decToBcd(byte val){return( (val/10*16) + (val%10) );} //Decimals to binary (clock)
byte bcdToDec(byte val){return( (val/16*10) + (val%16) );} //Binary to decimal (clock)

void setDS3231time(byte second, byte minute, byte hour, byte dayOfWeek, byte dayOfMonth, byte month, byte year)
{
    // sets time and date data to DS3231
    Wire.beginTransmission(DS3231_I2C_ADDRESS);
    Wire.write(0); // set next input to start at the seconds register
```

- Designing the case using Fusion 360

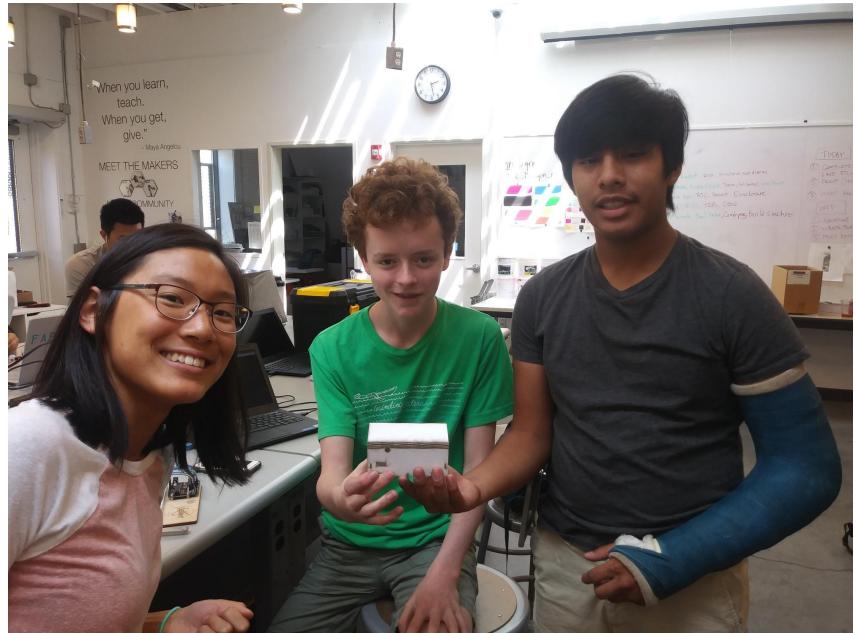
Future Improvements

- Added a LCD screen so people passing by could also help
- Use a different SIM shield
- Add a fan!
- Incorporate directly into car
- Solar power



Things We Learned

- Things don't always go as planned
- It might take multiple tries to achieve your goal
- If you have questions, ask your teammates



Any Questions?

Q&A

