# TEXAS ★ STATE ®
## INGRAM SCHOOL OF ENGINEERING

# E1.05 - San Marcos Heat

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TXST
HEALTH AND HUMAN PERFORMANCE

## Product Description

This product is beneficial because of the impact, and capabilities it can provide that will help cities/businesses devise strategies to alleviate heat caused by heat islands.
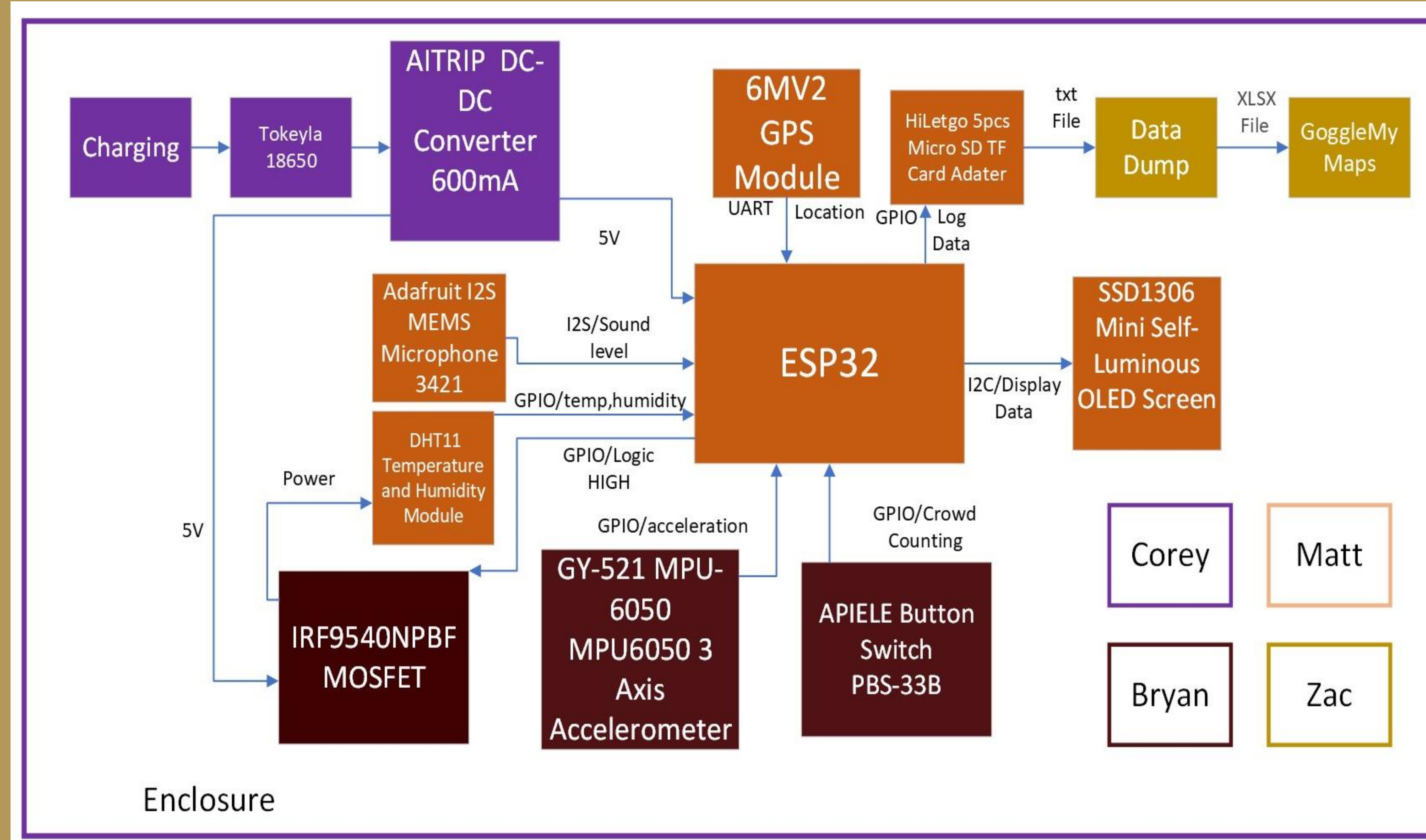
## Requirements

- Records temperature, humidity time, position, sound, crowd size
- 40mm x 40mm x 100mm case size
- 150g max weight
- 4/48hr active/idle battery life
- $30 budget
- Can store one-month worth of data

## Features

- Easy to understand display and controls
- Handheld design
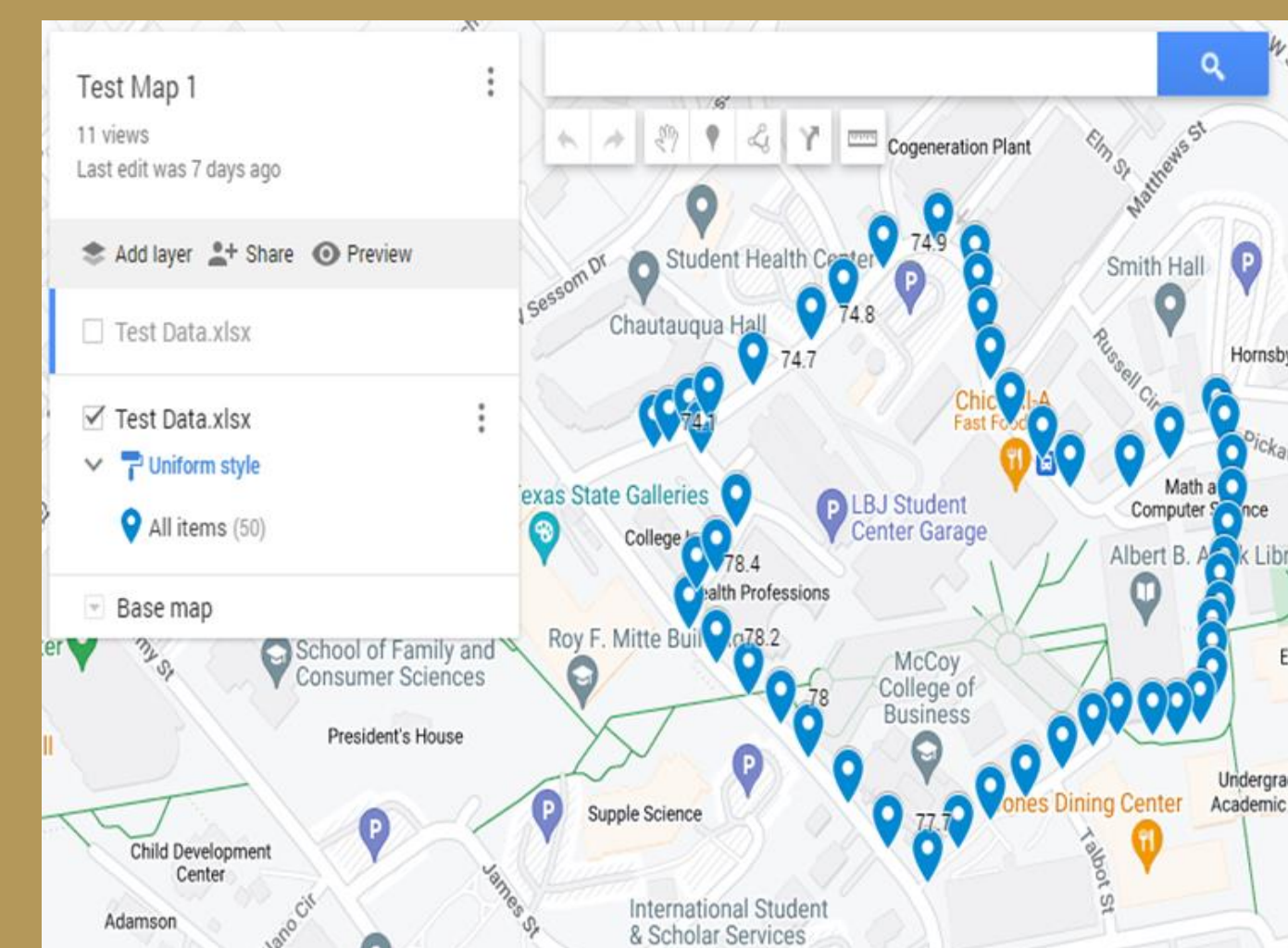- Detailed user manual
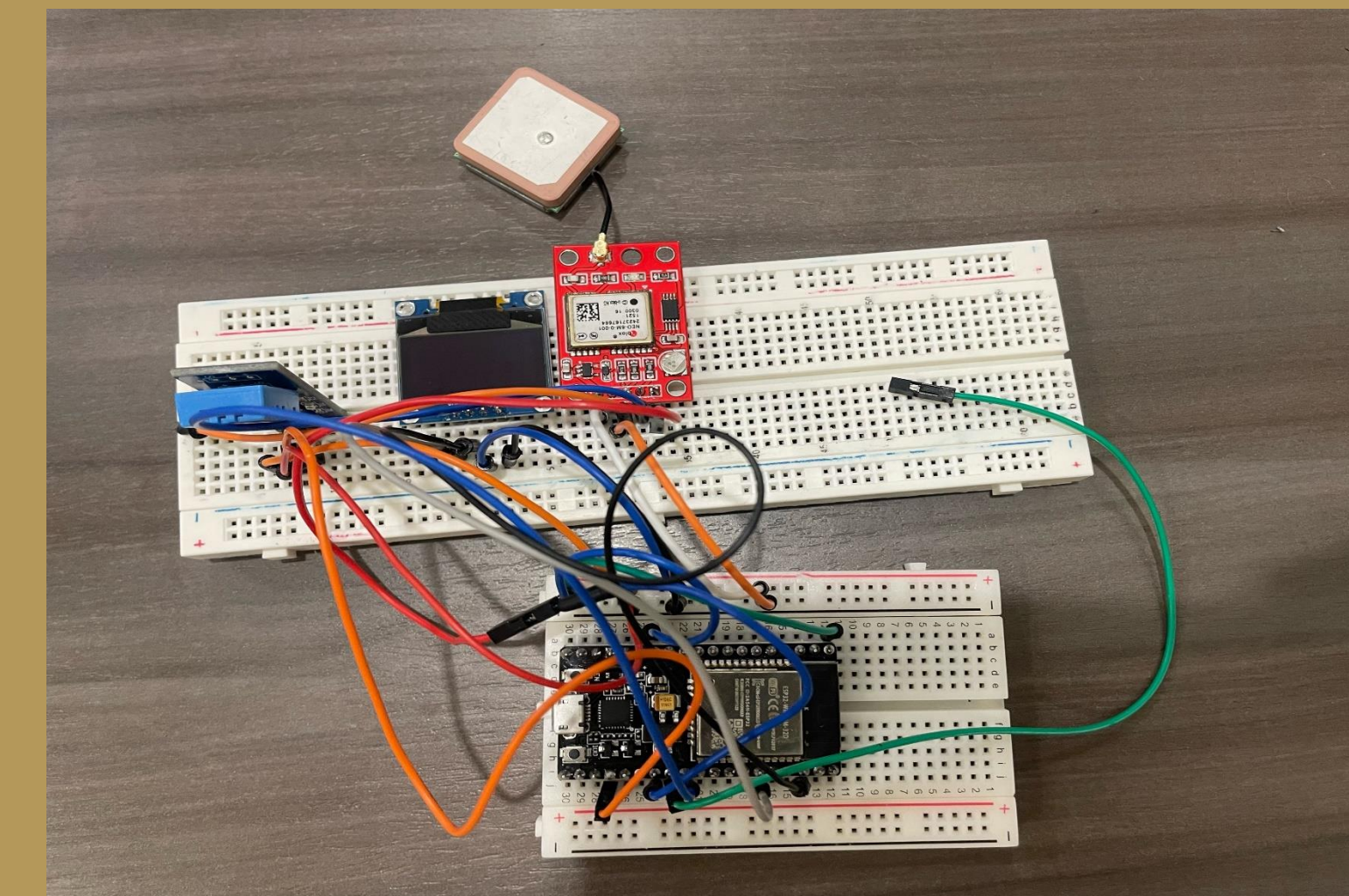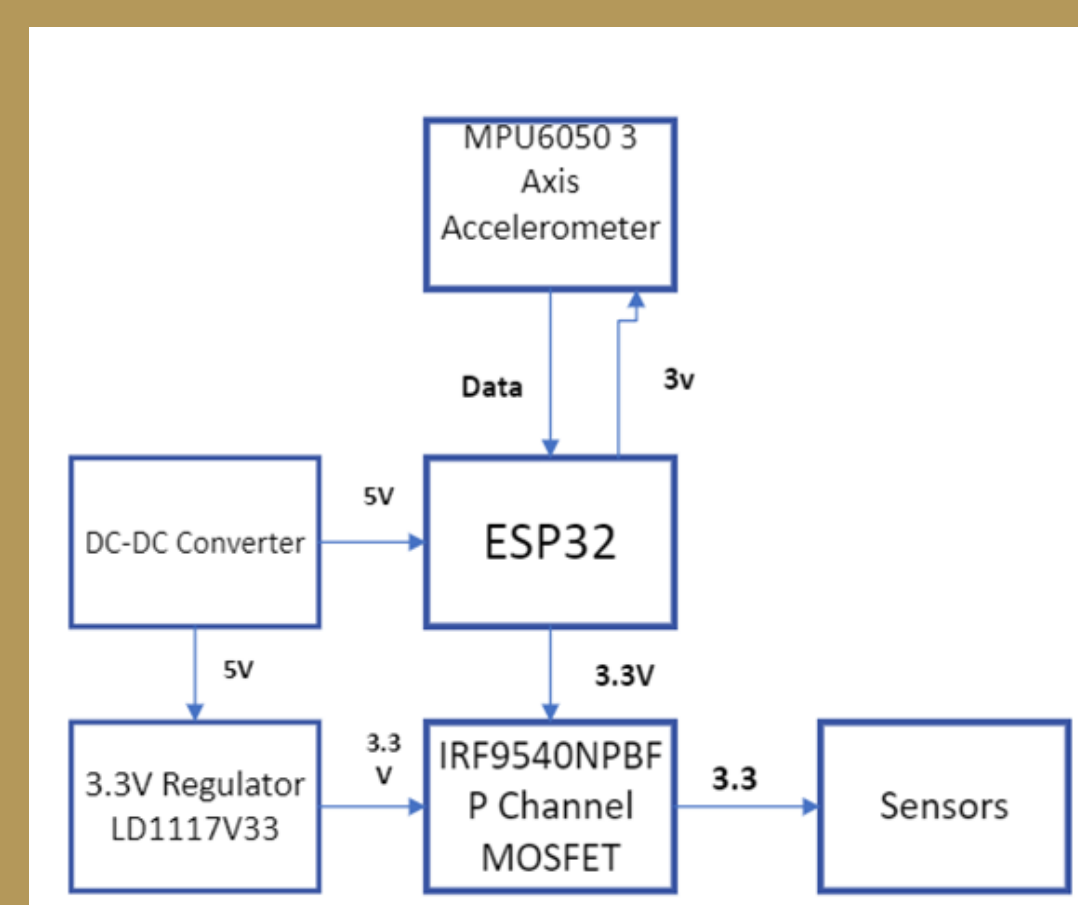- Internal data storage

## Top Level Block Diagram

Charging → Tokeyla 18650 → AITRIP DC-DC Converter 600mA

6MV2 GPS Module

HiLetgo 5pcs Micro SD TF Card Adater → txt File → Data Dump → XLSX File → GoggleMy Maps

Adafruit I2S MEMS Microphone 3421 — I2S/Sound level

DHT11 Temperature and Humidity Module — GPIO/temp,humidity

5V / UART / Location / GPIO / Log Data

ESP32 — I2C/Display Data → SSD1306 Mini Self-Luminous OLED Screen

IRF9540NPBF MOSFET

GY-521 MPU-6050 MPU6050 3 Axis Accelerometer

APIELE Button Switch PBS-33B

Power / GPIO/Logic HIGH / GPIO/acceleration / GPIO/Crowd Counting

Corey | Matt
Bryan | Zac

Enclosure

## Individual Subsystems

### Data Mapping Application

### Sensors & Microprocessor

### Stanby mode/Crowd counter

MPU6050 3 Axis Accelerometer — Data / 3v

DC-DC Converter → ESP32 / 5V
5v → 3.3V Regulator LD1117V33 → IRF9540NPBF P Channel MOSFET → Sensors

### Power & Enclosure

## Current Progress

- Developed prototype that that records all required data
- Researching water prevention and air ventilation tactics for the case.

## Design 2 Project Goals

- Design a water resistant/drop resistant enclosure
- Have a minimum of 15 different non-engineering users test the device and create a map from the data they collect
- Develop on-board charging system
- Log 100 unique locations around campus

## Spending Per Subsystem

| Subsystem | Price |
| --- | --- |
| Sensors | $32.39 |
| Power | $14.42 |
| SD / Misc. | $8.37 |
| Total | $55.18 |

## Acknowledgements