




UNT College of **ENGINEERING**

Senior Design Day 2019



Department of
ENGINEERING
TECHNOLOGY



ELECTRICAL ENGINEERING TECHNOLOGY



Solar- Charged Atmospheric Particulate Matter Monitor

Team Members:

- Jasson Paragas
- Estefano Mateos-Rivas
- Steven Clark

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

- Dr. Elias Kougianos

Abstract:

Our Atmospheric Particulate Matter Monitor, APMM for short, provides a safe and portable option for collecting PM2.5 information in its immediate surroundings. With the inclusion of a solar panel, battery, and charging circuit, our version of Butrón-Guillén's APMM will be able to provide enough energy, using solar power, to power itself without the need of a wall adapter. The new design includes a PM2.5 sensor that will give us readings of PM2.5 particles in the surrounding area instead of relying on data from miscellaneous websites. The design is compact enough to attach to a drone or robot to bring into a hazardous area safely, as well as display data through a phone app and LED matrix for ease of use and readability.





Digital Spirit Level

Team Members:

- Mohammed Almazroey
- Naif Alsarrani
- Shengtong "Rick" Wang

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

- Dr. Elias Kougianos

Abstract:

This project is a measurement tool designed to indicate whether a surface is horizontal or vertical, generally used by carpenters and construction workers. The advantages over the conventional design is to have an entirely remote readout and precise result of measurement. It measures the angle between itself and the surface, and the distance from the spirit level to any object within 4 meters. This project has a Bluetooth module that enables the user to connect it to a cellphone and receive data from the device and display data on our custom app. Solar panels are built in the device to charge the battery and allow power to pass when the battery is fully charged.



The original idea came from:

<https://howtomechatronics.com/tutorials/arduino/arduino-range-measurer-and-digital-spirit-level-project/>

Sonar Speaking Stick

Team Members:

- Ehinomen Edo
- Abdullah Albahrani
- Mahmood Aldamin

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

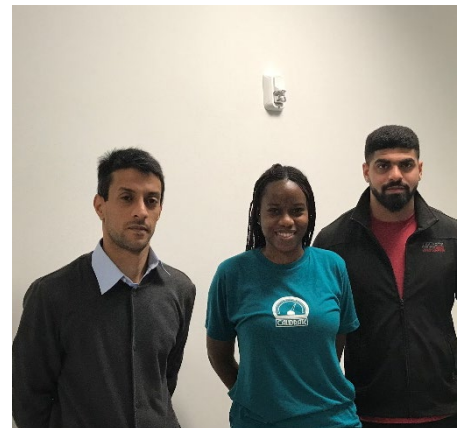
- Dr. Elias Kougianos

Abstract:

The speaking sonar stick is a device used by the visually impaired. The project can be packaged to make a distance sensing walking stick for the blind and visually impaired for navigating their course.

For a tactile feedback to be provided instantly, the relay outputs may activate small vibration devices. It consists of an ultrasonic cane for the user, an LCD readout display and a Raspberry Pi microcomputer which can monitor, administer and execute functions, at the same time and at a good speed.

The most innovative feature of the sonar stick is the GPS which helps the visually impaired to be tracked and also provides audible directions.





Automotive Telemetry Project

Team Members:

- Abdel-Qader, Omar
- Jeikowski, Kurt
- Maag, Nicholas
- Richmond, Jacob

External Sponsors/Mentors:

- N/A

Internal Sponsors/Mentors:

- Dr. Elias Kougianos

Abstract:

Our project collects telemetry data from any vehicle and displays it to the driver while also transmitting that data for off system records. The data is collected from the On-Board-Diagnostic (OBD) system, a GPS and an accelerometer. The data is fed into a Raspberry Pi that runs the graphic to display the data on a touchscreen while wirelessly transmitting the data to an Internet of Things (IoT) system for later review.

Off-line analysis of the collected data is possible either at the car itself or from a laptop/desktop computer.

