Nomadic GPS Corrected Anemometer

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ANEMOTION
ACCURACY IN MOTION

Abstract

AneMotion is an electrical/computer engineering undergraduate research project. The idea of the project is to take an anemometer, which can only record accurate data while stationary and oriented, and create a design that records data while in motion. The goal is to be able to attach the device to a moving vehicle such as a uav/drone and be able to record real time accurate wind data at any velocity and direction. This design will provide use in many fields such as environmental data research where wind velocity and direction is recorded and studied.

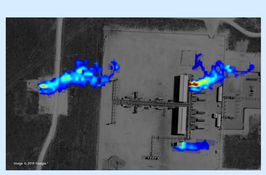
Need for Product

Anemotion will provide accurate real time wind velocity and direction data.

- Current wind monitoring solutions involve stationary anemometers
- Environmental scientists must take this stationary data and model it
- Modeling wind data is time consuming and imprecise
- A nomadic anemometer will allow real time wind monitoring

Design Concept

- Implement a compass, GPS, and accelerometer along with the anemometer mounted on a wirelessly controlled drone to get accurate wind readings higher up in the atmosphere while the drone is flying
- Use the data gathered by the compass, gps, and accelerometer and put it in an algorithm along with anemometer data to provide more accurate, wind corrected readings



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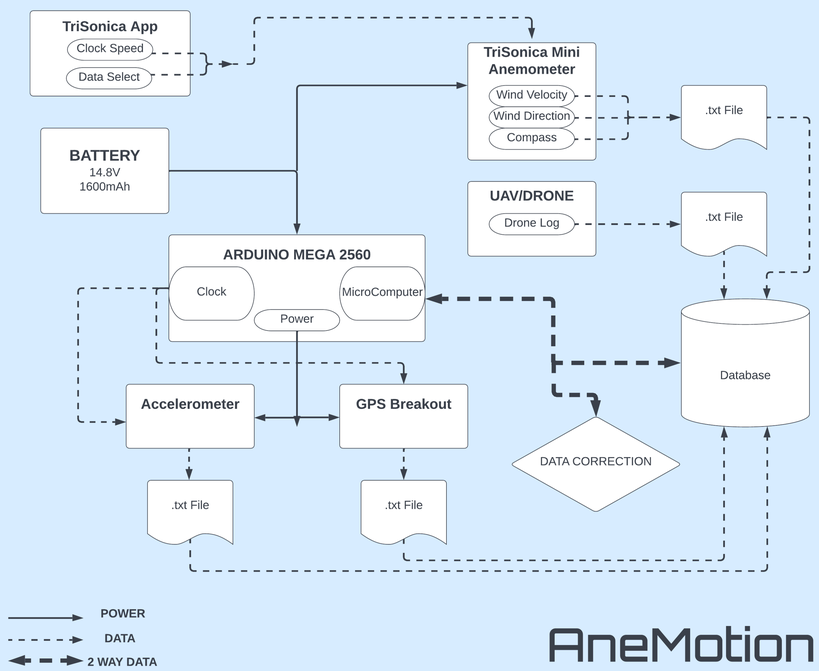
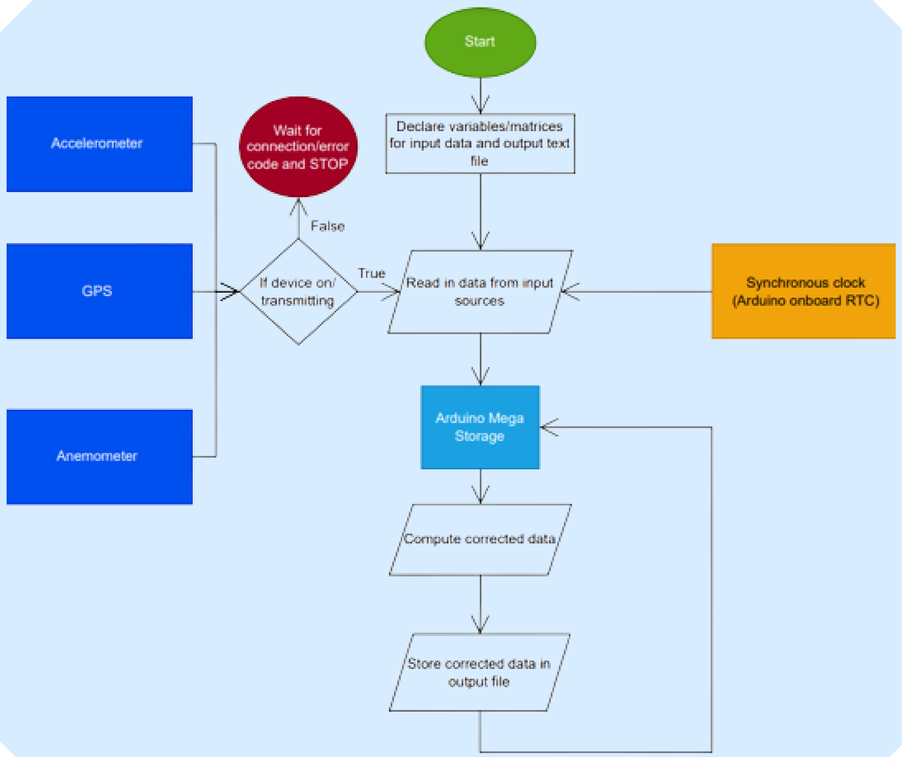
Block diagram

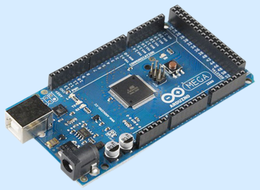


Software Flowchart



Components

- Arduino Mega 2560
- Trisonica Mini Anemometer
- Adafruit Ultimate GPS
- Adafruit ADXL345 Accelerometer



Future Work

- Have the anemometer and the GPS record data simultaneously using the Arduino
- Recording wind data while the anemometer is stationary and while it is in motion
- Have a fixed anemometer vs anemometer in motion to prove accuracy
- Design finalized schematic and PCB for completed circuit
- Attach working completed circuit to drone for real world application

Glossary

- **Accelerometer**- A device used to measure acceleration
- **Anemometer**- Device used to measure wind speed
- **Micro controller**- Micro computer used to control embedded systems

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