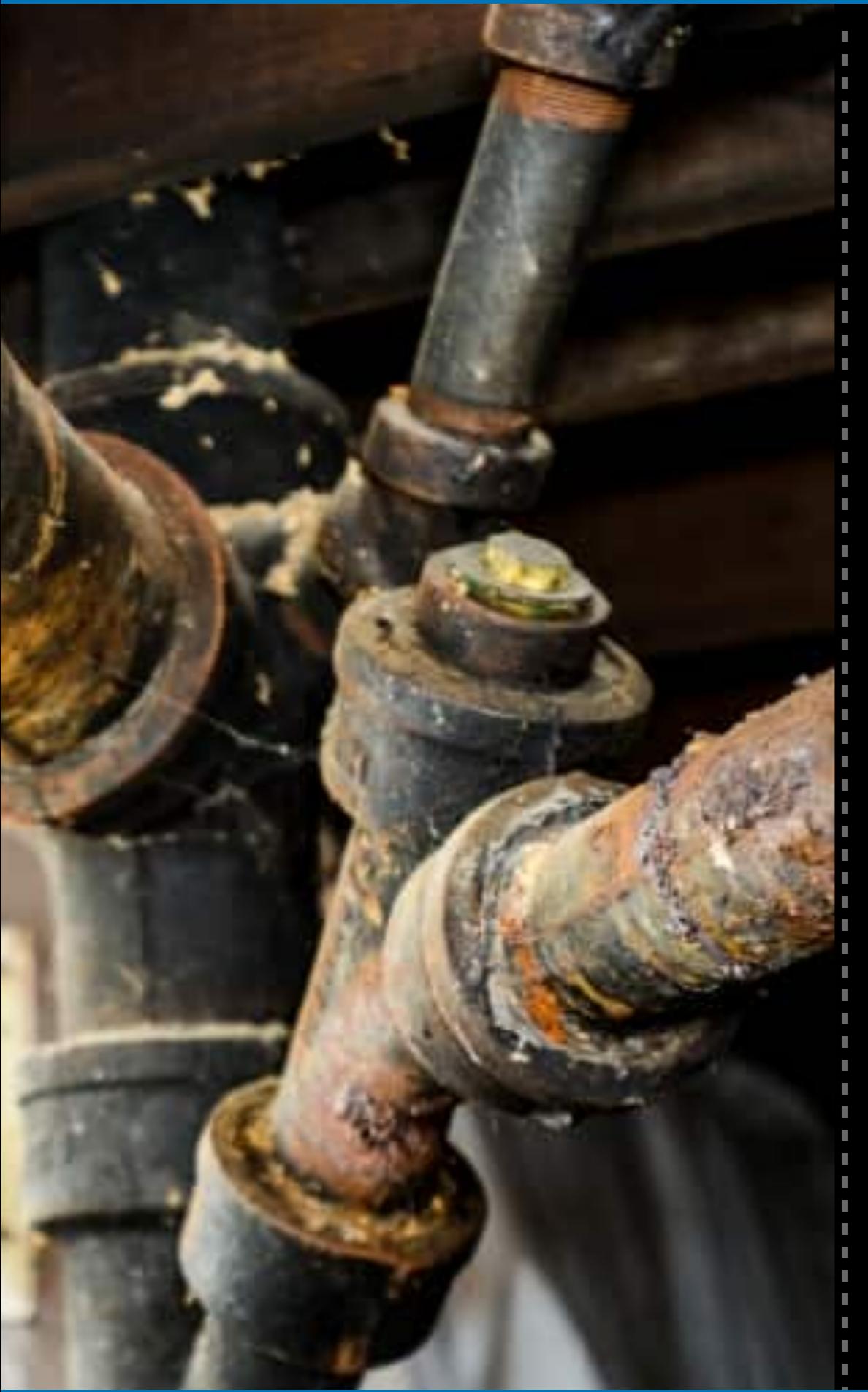




Auto Leak Detection

(Water Leakage Detection and Management System using Internet Of Things)

Guidance Manual



System Requirement and social welfare

In a perfect world, water resource management planning has regard to all the contending requests for water and tries to designate water on an impartial premise to fulfil all uses and requests. As water turns out to be rarer, the significance of how it is overseen develops vastly.

About 20 percent of the water produced is simply wasted because of underground water leakage which goes undetected and some old or worn-out pipes might end up wasting 50 percent of water in supply. Water leakage detection program that has been proposed, identifies and reports leakage problem and reduce previously undetected leaks.

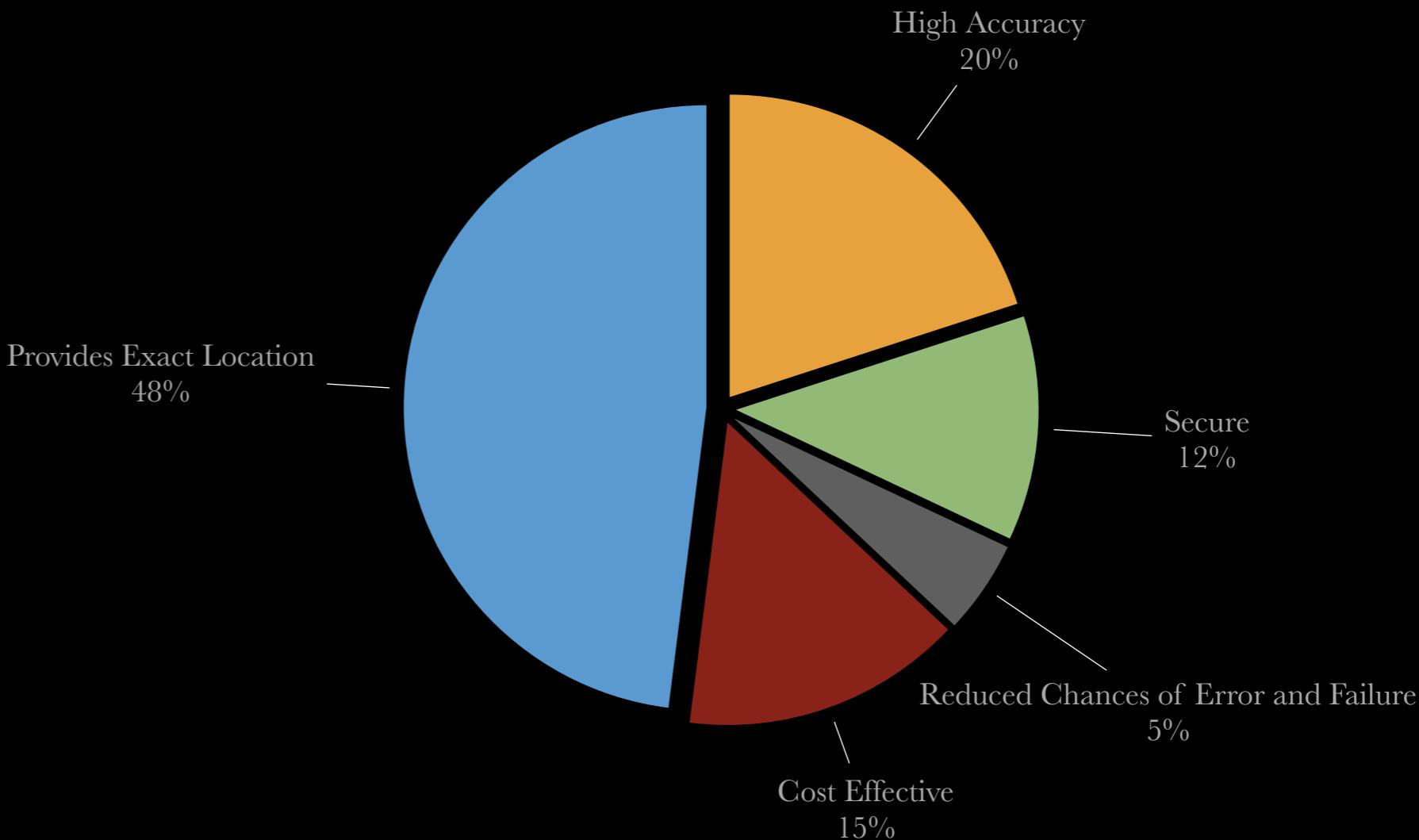
The system is required because leakage in pipes lead to:

- * Health issues of people due to contaminated groundwater.
- * Ineffective supply management.
- * Ineffective demand management.
- * Weakening of the physical infrastructure.

Key Features

Water being a non-renewable resource is critical for human sustainability and proper methods are to be incorporated to ensure more longevity and better management for future needs, hence a foolproof method is required for water management and detection of leaks to eradicate the issues that are associated with it.

Some key features procreated in the proposed system which lack in existing models in similar domain are:



System Flow

Leak Occurs

Pressure difference between the two sensors is observed

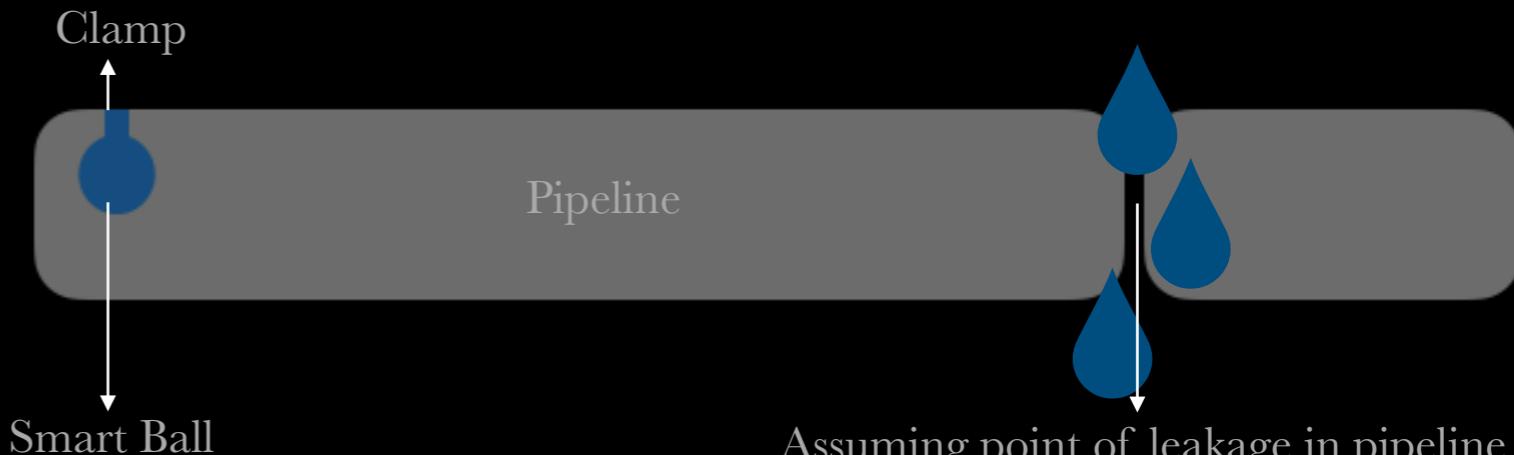
The Smart Ball towards the Water inlet end dislodges from its position

The Smart Ball equipped with GPS sensor reports the location and Pressure value at fixed intervals

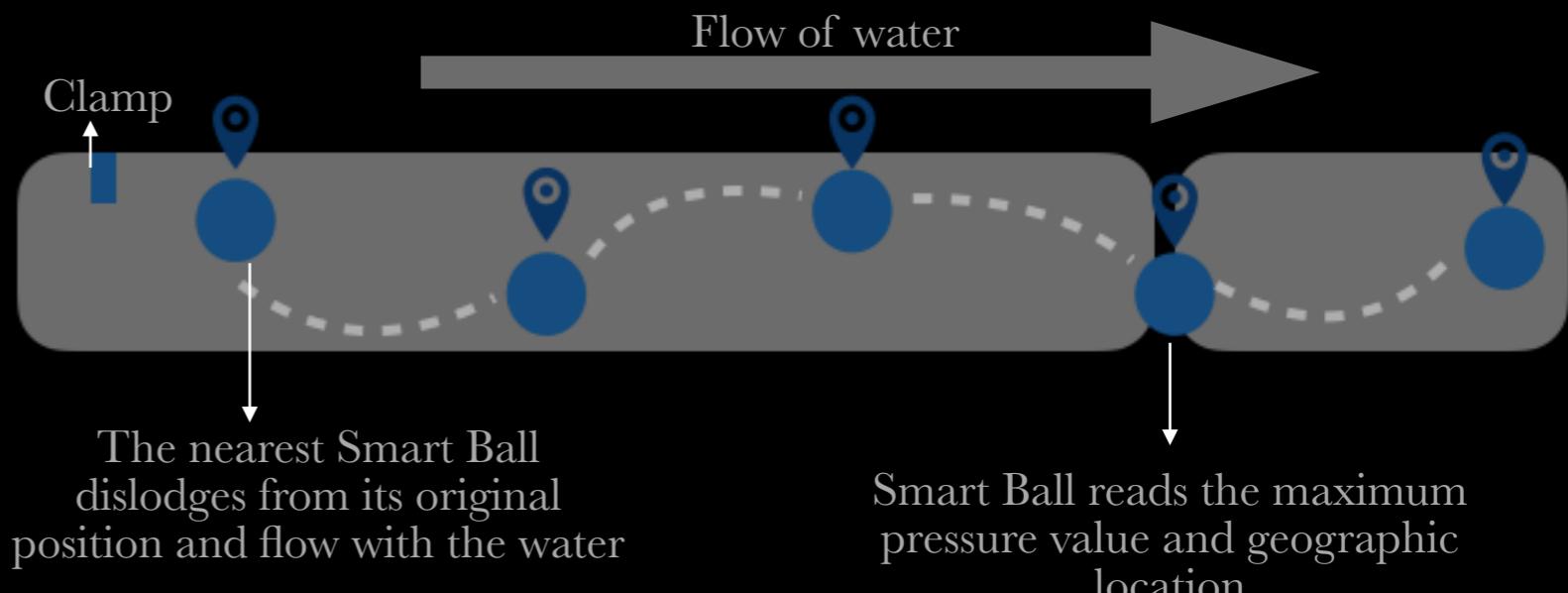
The point where the maximum pressure difference is observed is identified as the source of the leakage

The maintenance team reaches the spot and takes the appropriate countermeasures

Initial Setup



Setup after the leak has occurred and the ball dislodges from its position



Smart Ball reads the maximum pressure value and geographic location

Key Components

Software Requirements:



Arduino

(Software to write and upload code to Arduino Uno Board)



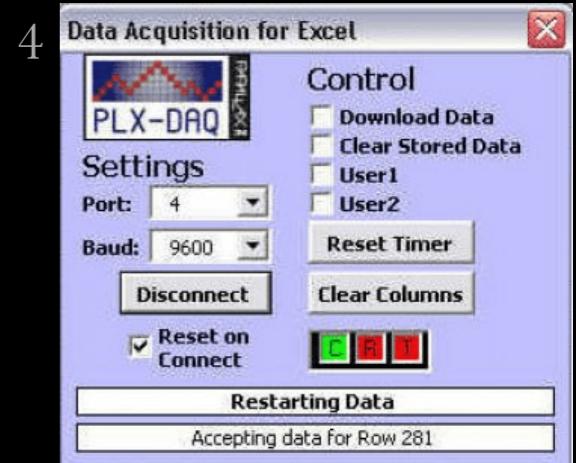
Microsoft PowerApps

(Microsoft 365 platform for creation of Applications)



Microsoft PowerBI

(Tool for sophisticated Business analysis and data representation or visualisation)



PLX-DAQ

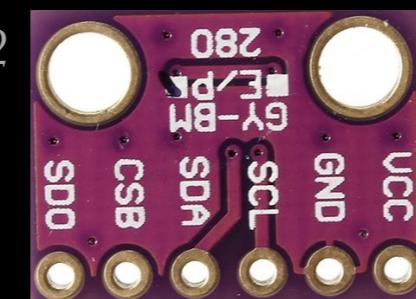
(Data Acquisition tool for Excel)

Hardware Requirements:



Arduino UNO

(A microcontroller board)



BMP 280 Sensor

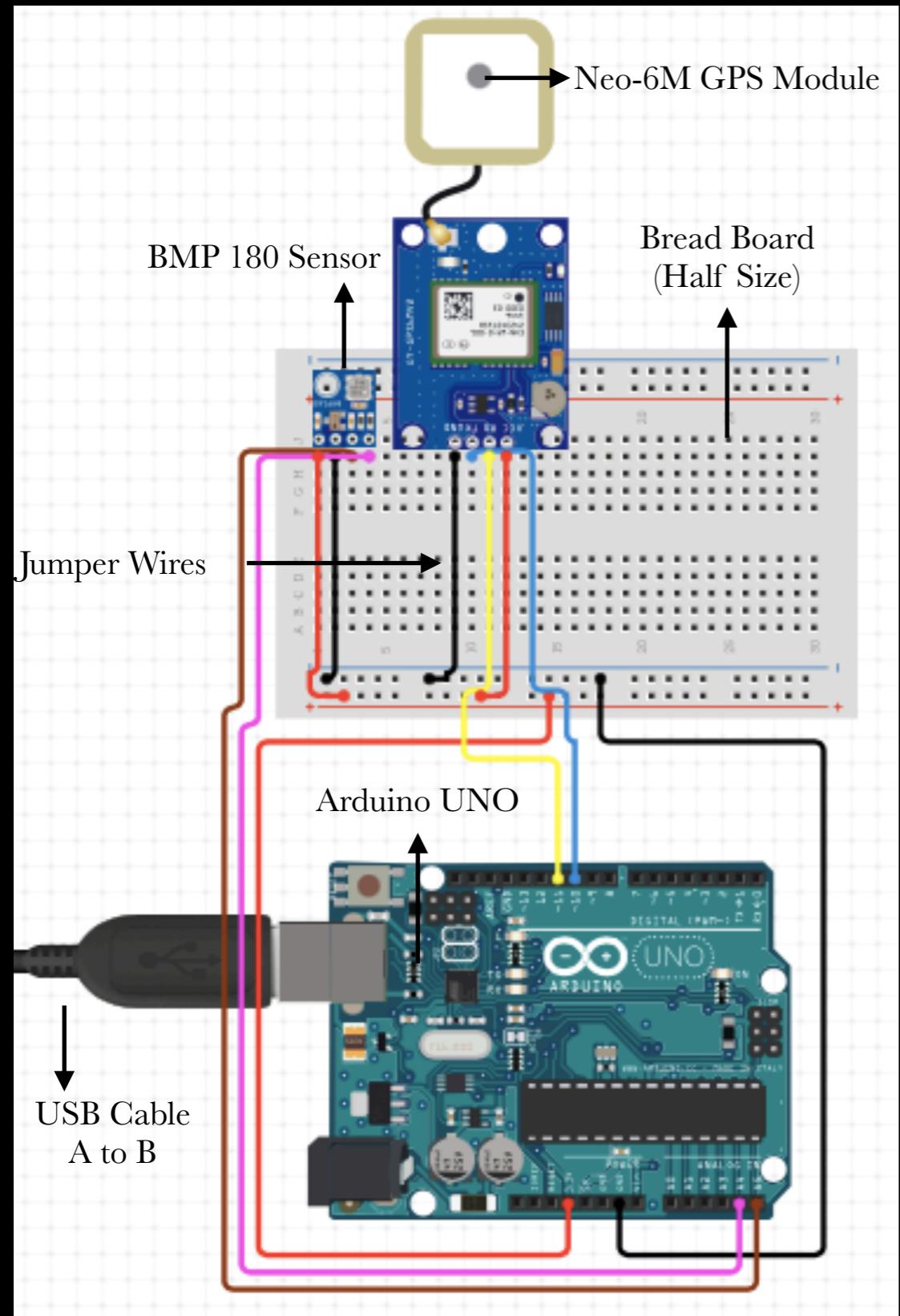
(The BMP 280 is based on Bosch's proven Piezo-resistive pressure sensor)



Neo-6m GPS

(Global Positioning System to collect the geographic location)

Smart Ball Connection



Circuit Diagram

Actual Connections

