

Height Monitor

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Overview

For our project, we would like to implement a height monitoring device that can take measurements on different objects. The user will press the start button and begin moving the monitor upwards until it reaches the desired height. The accelerometer will be used to detect when the monitor stops moving and the distance between the device and the ground will be obtained from the ultrasonic sensor.

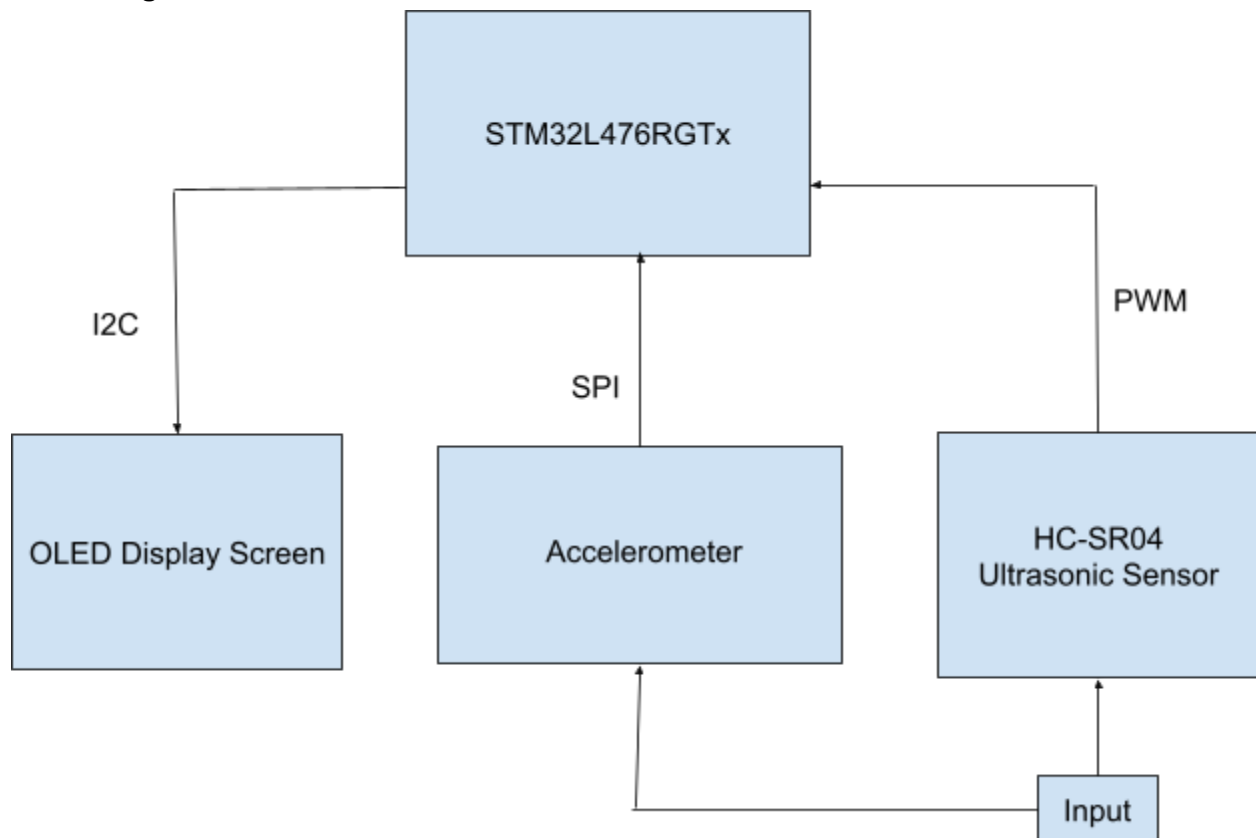
Peripherals:

HC-SR04 Ultrasonic sensor
OLED Display
ADXL343 Accelerometer

Serial Interface Protocol

- I2C
- SPI

Block Diagram



Software Structure

PWM will be used to interface with the HC-SR04 Ultrasonic sensor and we will obtain distance measurements. SPI will be used to interface with the accelerometer and monitor the current movement. The accelerometer will send an interrupt when it detects no further movement and we will record the current distance between the monitor and the ground using the ultrasonic sensor. I2C will be used to interface with the OLED screen and display the recorded height along with a message.

Responsibility List

- Implement data gathering from HC-SR04 Ultrasonic sensor and handle conversions between pulse-width, distance, and speed.
- Interface with LCD display using SPI and display the speed and warning message.

Project Site: <https://johnsonlin2001.github.io/SpeedMonitor/>