

# Missile detecting and warning system

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## 1. Overview

In this project, we aim to design a missile detecting and warning system (MDWS). This system, enabled by a couple of sensors, including a thermal sensor and a distance sensor, will detect the approximate direction moving item which has the thermal and moving characters, show its approximate location on the LED matrix and give the warning by a buzzer. if we have additional time, we would like to add a projecting device which could project the interference items, such as foil, to the specific direction.

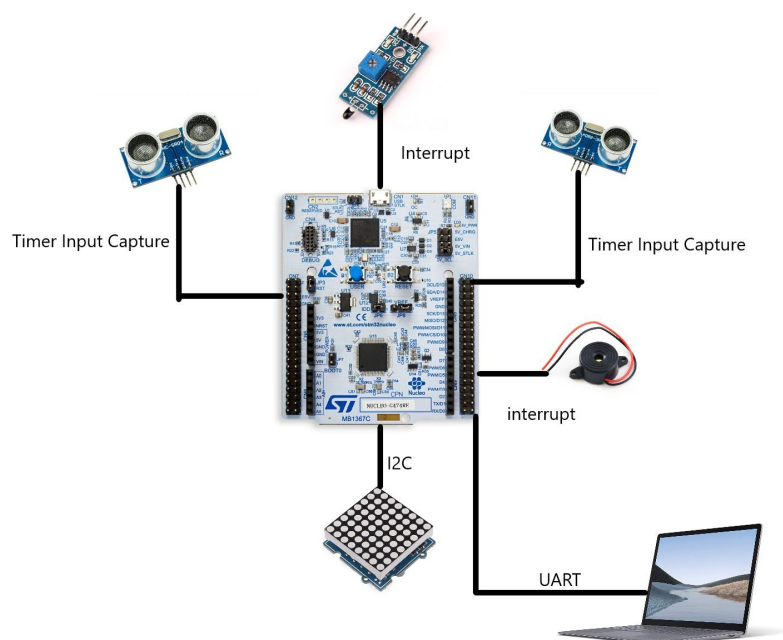
## 2. Expected protocol (Temporarily)

The protocol we would use would be I2C, UART.

## 3. Expected peripherals

Distance sensor, thermal sensor, ultrasonic sensor, LED matrix, Computer

## 4. Block Diagram



## 5. Software Design

First, we would use the timer input capture with the ultrasonic sensor to calculate the direction of the moving object. Then, the thermal sensor would work as an anti-interference device, which could ensure that the moving toward item has the thermal character which could be highly considered as the enemy's missile. Once we check the threatening device, the sensor will transmit the data to the LED matrix using I2C protocol to mark the direction of the moving object. Meanwhile, the buzzer will be triggered to warn the user. Finally, the board would transmit the event log back to the computer using UART protocol.

## 6. Responsibility List

Limin Ding:

- Configure the LED matrix with I2C protocol, implement library functions
- Configure the Buzzer, trigger action to ring the alarm
- Configure the UART protocol with the computer

Xianqi Wang:

- Implement the speed detection algorithm
- Configure the distance sensor
- Configure the thermal sensor
- Set up the projecting device (optional)

## 7. Project Website

<https://sites.google.com/view/ece153b-project>