

SIT210: Embedded Device Development

Task 4.1P mBed: Ultrasonic sensor

Hardware Required

- mBed
- Ultrasonic sensor 2 options: I2C sensor SRF08 (more expensive) or PWM sensor SR04 (cheaper)

Software Required

- Browser
- For SRF08 library: <https://os.mbed.com/cookbook/SRF08-Ultrasonic-Ranger>

Pre-requisites: You must do the following before this task

- All previous mbed task

Task Objective

- 1) Create a schematic diagram, using the breadboard to connect the SR04 sensor to digital pins of mbed.
- 2) Consult the datasheet of the SR04 at <http://www.micropik.com/PDF/HCSR04.pdf> to work out the logic for using the SR04.
- 3) Read the distance data and divide into 3 regions: far, close, and closest.
 - When the ultrasonic sensor senses an object within the far region, the system turns on the mbed LED.
 - When an object comes to the close region, the system blinks LED slowly.
 - When the object comes to the closest region, the system blinks LED rapidly.

Task Submission Details

Q1: Submit a video that demonstrates the system working.

[Ultrasonic Video](#)

Q2: Create a repository named ultrasonic on Github. Upload your code to the repository. Include the link to your repository here.

[Ultrasonic Repository](#)

Q3: Describe a real life usage scenario for your system.

This system could be used to help you park a car or to connect a trailer, to help you sense objects that are not visible from the driver's seat.

Another situation could be for inside a corn or wheat silo, the sensor could be used to sense when it is nearing being full. It means that the driver can do his work from a safe position or save time climbing up and down the ladder when he is transferring the load from the truck.

Remember to submit this to Doubtfire, and check the status of any existing tasks. You may need to fix and resubmit some of your work. You want to check out why, so that you can learn from this and make it faster and easier to get later work to the required standard.