Lab 3 for CSE121, Spring'23

Due Date: 05/3/23

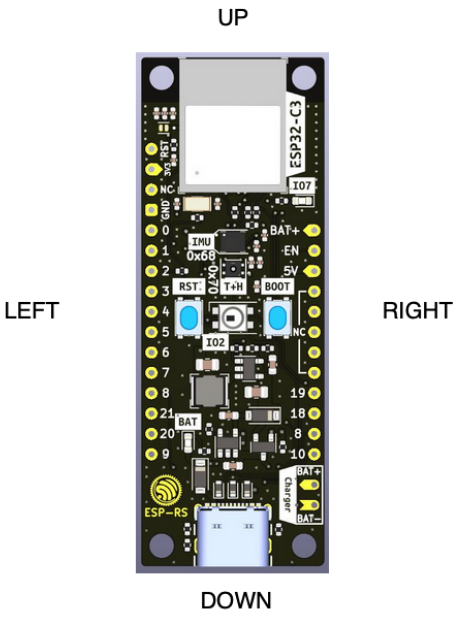
This lab is worth 20 Points. The overall objective of this task is to use the ICM-42670-P on the RUST ESP32C3 board as a Bluetooth mouse. Each time the board tilts, it should move the mouse in the X/Y direction accordingly. There are some specific rules on how to control the mouse and the test to pass.

It is VERY important to submit the report.pdf. If this file is missing, you lose ½ of the points.

Lab 3.1: Board movement (5 points)

Write a program to print in the terminal (ESP_LOGI) the UP/DOWN or LEFT/RIGHT depending on the board inclination.

Since there can be more than one direction, Two words may be printed. E.g: If the board is inclined UP and LEFT, it should print "UP LEFT".



Lab 3.2: Move mouse left/right (5 points)

This lab requires you to reproduce most of the class Bluetooth project but instead of showing the volume up/down, it should move the mouse left to right on the screen, then pause for 5 seconds.

You have to demonstrate during checkout that it connects to the raspberry pi and that it moves.

Lab 3.3: Integrate (10 points)

Integrate labs 3.1 and 3.2 so that the board inclination controls the mouse with some extensions. To control the speed of the mouse movement, the inclination level should be considered with at least 2 levels (A_BIT_LEFT…A_LOT_LEFT).

There should be some “acceleration” (linear or non-linear). You can choose the best way, but a possible way is to use something like this for the X-axes when inclined left:
`total_x_delta=a*x_delta`

The first time that LEFT is found a=1, if 10ms later still set, a=2, if 50ms still set a=3.
The idea is that you find some values that make your movement controllable. The x_delta depends if it is A_BIT_LEFT or A_LOT_LEFT.

You should be able to use the ESP32 board to click the close window in less than 5 seconds. This means that the TA would move the mouse somewhere in the screen, open a terminal, and you should click to close the terminal in less than 5 seconds using the ESP32 board. You have 3 tries. For each additional 3 tries, you lose 1 point.

What/How to submit

Same instructions as lab1. Upload the zip with the code and report.pdf to Canvas.