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SIT210 - Task 7.3D

Q1: Submit a video that demonstrates the system working. Your video should include a brief description of how you have programmed the device, and how the devices are connected together (pins, and communication protocols used if any)

YouTube Link:

https://youtu.be/SIfpDGaSafg

Description of Device:

The device is configured to continually loop and use the ultrasonic sensor to obtain the distance of whatever it is pointed at and converts that distance into a PWM value between 0 and 100%, then during each cycle this number is updated and the PWM value is used to define the intensity of an LED to show that distance value, the brighter it is the closer the object is.

The ultrasonic sensor is powered to +5v and Gnd of the GPIO Header, Trigger is connected to GPIO xx and Echo is connected to GPIO xx via a voltage divider circuit made of 2x 7.5K resistors in parallel (3.75K) and a single 7.5K resistor to bring the +5V Echo signal to ~3.3v to avoid damaging the Raspberry Pi.

The LED is connected GPIO xx and ground via a 220ohm resistor and controlled by PWM

Q2: Create a repository named SIT210_Task7.3D_RPiPWM on GitHub. Upload your code to the repository. Include the link to your repository here.

GitHub Link

ProfessionalDevelopment/Uni Files/SIT210 - Embedded Systems Development/Task 7-3D at main · CrashOverrideProductions/ProfessionalDevelopment (github.com)

Q3: Briefly (around 200 words) describe how you would improve the system.

I would like to find a more streamlined equation for calculating the PWM value instead of calculating the distance in centimetres then calculating percentages and inverting the value, along with overall tidying up code and making it more concise and simpler. An improvement for the schematic would be to use a Logic Level Shifter for the Ultrasonic Sensor data lines as currently only the Echo line is at the correct voltage.