CSE 237A Individual Project Part 2

Part 2 of 2: Sensor interaction and real-time scheduler Assignment

In this part, you will implement a program which interacts with the RPi3's sensors. The RPi3 provides multiple General Purpose Input/Output (GPIO) connectors, which carry signals to/from the sensors. You will connect the sensors to the RPi3, and implement a user space program using the WiringPi library for GPIO communications. The program you will create emulates a sensor platform that detects emergency situations in operating vehicles. Subsequently, you will use the base code that extends sensors with longer latencies, on which you will implement an your energy efficient scheduler.

Complete the following steps:

1. Familiarize yourself with wiringPi: http://wiringpi.com/
2. Implement a sensor interaction program based on skeleton code available in the projects folder on class website (http://cseweb.ucsd.edu/classes/wi17/cse237A-a/project/part2/)
3. Update your sensor interaction program, which now includes latencies, to implement an earliest-deadline-first (EDF) scheduler.
4. Implement an energy-efficient EDF scheduler for your application
    - The scheduler should manage your unique workloads available in the website (http://seelab.ucsd.edu/cse237a_wi17/)

Deliverables of Part 2:

- Complete and demo the individual project part 2 checkpoint with TA
- Submit the four files "assignment1.c, assignment1.h, assignment2.c, and assignment2.h" via TED. Your code must execute correctly using the predefined wiringPI PIN numbers and the other provided files to receive ANY credit for this part of the project.
- Submit your report with the source code on TED:
    - Maximum 3pgs, 12pt Times New Roman font, excluding figures and the table
    - Briefly explain how you implemented the sensor interaction program.
    - Discuss the design choices for your energy efficient scheduler
    - Provide a table for the three provided workloads with estimated CPU energy consumption and if the scheduler made or missed deadlines.
    - Do not include your source code in the report.
- All files must be zipped up, and the zip file should be titled with <user1_id>_<pid>.proj.part2.zip