DigiPen Institute of Technology Singapore

Department of Electrical and Computer Engineering

CS 397

Embedded Systems

Trimester 3, AY 2021/22

Project Requirements, Presentation, Demonstration, and Report

The final project is indented to develop an application with the acquired embedded knowledges and capabilities during CS397. The project implementation should include the following technologies or functionalities:

i.   Utilize the TM4C123G Tiva LaunchPad and Nucleo-F767ZI boards for the project implementation.

- Send data/message from TM4C123G board via CAN (Controller Area Network) to Nucleo-F767ZI board.

ii.   TM4C123G Tiva LaunchPad:

- Data/message of up to 8 characters (bytes) to be sent from the PC terminal through the Virtual COM Port (VCP) to the Tiva LaunchPad. Baud rate and serial parameters to be implemented by implementer.
- Display data/message on LED matrix as a continuous scrolling message.
- Data/message is then sent through CAN to the Nucleo-F7767ZI.
- Use the example program provided as starting point.

iii.   Nucleo-F767ZI board:

- Configure two channels of DACs and four channels of ADCs (included MCU temperature measurement).
- Configure one USART channel for displaying information.
- Utilize all on-board LEDs for meaningful indications.
- Implement CAN (Controller Area Network) for data transfer.
- Demonstrate a web server for a meaning application. Data can be sent between the server (Nucleo board) and any clients (PC or mobile device) that connected to the same local network.

- Display the temperature reading of microcontroller and other information on the web-page.

1. The minimum project requirements

You are required to form a three-member project team to work on the project. The project team is to implement a meaningful embedded system involving above-mentioned technologies and functionalities. The team is also required to present, demonstrate, make video recording, and document the project work. The work should cover the following areas:

1.1 Overall implementation (hardware and software)
The project report and presentation should include
1) Objectives of the project,
2) Description of the implemented project,
3) Diagrams of the implemented system,
4) Block diagrams of the software architecture, and
5) Conclusions.

1.2 Highlight of implemented features
In the presentation/report, a summary of the developed features should be presented/described. It is good to provide information for each implemented feature including the purpose, diagram, equation, and program pseudo-code.

1.3 Submission
1) Project report,
2) Presentation file,
3) Project demonstrations (videos),
4) Project source code in a zip-file,
5) Peer review form, and
6) Personal reflection.

1.4 Submission and presentation deadlines
1) The due date for presentation file is on **09 August 2022**, 2359 hrs.

2) The project presentation (final assessment) is scheduled on Wednesday (week 14), **10 August 2022**, from 9:00 am to 12:00 noon.

3) The due date for the project report, improved presentation file, video(s), project zip-file, peer review form and personal reflection are on **14 August 2022**, 2359 hrs.

1.5   Important Notes:

1) Achieve the minimum project requirements may not guarantee a complete fulfilment of the project.

2) Your project contents and submitted documents such as the final project report, presentation file, videos, and source code must have the standard/quality to obtain good marks.

3) During the project presentation, you are required to come in the scheduled time slots to present your project. All project members are required to participate and present the project.

4) The scheduled project demo and presentation (final assessment) time slots on week 14, **10 August 2022,** are

Time Slot	Time	Project Team
1	9:00 am – 9:30 am	1
2	9:30 am – 10:00 am	2
3	10:00 am – 10:30 am	3
4	10:30 am – 11:00 am	4
5	11:00 am – 11:30 am	5
6	11:30 am – 12:00 noon	6

5) Please return all signed-out items (exclude the connecting wires) back to the DigiPen faculty office (SIT@SP) by week 14, **12 August 2022, Friday, before 5:00 pm.**

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