University of York

Second Year Project

Embedded Systems Project Written Report

Author:
Douglas Parsons

Supervisor:
Dr. M.J. Freeman

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Chapter 1

Introduction

1.1 Summary of project work

The Second Year Embedded Systems Project was a ten week project, undertaken for the duration of Spring Term 2014-2015. The project was a primarily a group task, completed in groups consisting of four members. However, there was also the capability for individual extensions to the main body of the project, allowing each member to showcase competency and creativity.

The group project involved programming an ARM LPC1768 'MBED' microcontroller, situated on top of a board of peripheral accessories, in order to generate and play music on a user selectable channel corresponding to data being sent down a Controlled Area Network bus (CAN bus). The individual component was not specified, and was instead left up to each individual to decide on an extension project, research, and implement it.

The groups solution was very complete, not only matching the full spec, but also extending the implementation to a high degree, producing a user friendly, good sounding end product.

My individual extension provided a more user friendly interface than the rudimentary keypad attached to the MBED board through the implementation of a shell type interface, allowing the user to input commands, and adjust settings though the use of the computer keyboard and monitor.

1.2 Experiences as a team

The team aspect of the project was one that worked particularly well

1.3 Expectations and actual outcomes

1.4 What is in the report

This report sets out to provide a description of our team solution to the set assignment, as well as highlighting areas of individual contribution throughout.

The report will begin with a technical description of the set problem, including a discussion of requirements and technical challenges that may be faced in the meeting of these requirements. Following a description of the problem, the group solution will be discussed. The discussion will highlight how each section of the requirements has been met by the implemented solution, as well as detailing how the problem has been broken down for each individual member, presenting each members implementation and technical innovation. After a discussion of the group's solution, the appropriate testing strategies and methods that were used throughout the project will be examined in detail, providing feedback on how they have proved useful, and incorporating a discussion on a professional/social/ethical/environmental aspect of the solution. The report will then focus critically on my individual implementation, detailing the technical innovation, implementation, and testing undergone for my contribution. Finally the report will conclude with a reflective summary of work undertaken, considering which aspects of the project went smoothly, which areas did not go as smoothly, how this might be improved in future, and what lessons can be taken away from the completion of the project.

Chapter 2

Technical Description of Problem

2.1 Description of Problem and Requirements

2.2 Discussion of Technical Aspects and Challenges

Chapter 3

Description and Discussion of Team-based Solution

3.1 Description of the Team Solution

3.2 How the problem was broken down for individual members

3.3 Technical innovation and implementation of each member

Chapter 4

Evaluation and Testing of Team-based Solution

4.1 Description of the Team's Testing Strategy

4.2 Results of Testing Strategy and How Well This Met the Requirements

4.3 Section relating to a professional/social/ethical/environmental aspect of our solution

Chapter 5

Description, Discussion, Testing and Evaluation of Individual Component

5.1 Description of Individual Component Solution

5.2 Discussion of Technical Innovation and Implementation

5.3 Testing Strategy, and the Results

Chapter 6

Summary and Conclusions

6.1 Reflective Summary of Team Work

6.2 Reflective Summary of Individual Work

6.3 What went well

6.4 What went poorly

6.5 What could have been improved

6.6 Lessons Learned

Appendix A

Specified Documents

A.1 Meeting minutes

A.2 Evidence of Preparation