Joao Guilherme R. F. Lopes

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Education

Coventry University Group | Coventry September 2018 – July 2019

Foundation Engineering

Coventry University | Coventry September 2019 – November 2022

BEng in Computer Hardware and Software Engineering - Upper Second Class (2:1)

Skills

Programming: Java, Python, C, C++, SQL, HTML, VHDL, Assembly
Platforms: Linux (Ubuntu, Slackware, Debian), Microsoft Windows, Android, Mac OS
Hardware: Raspberry Pi, ARM Mbed microcontroller, Arduino, ESP-32
Software: Android Studio, Visual Studio Code, IntelliJ, GitHub, Proteus, Vivado, Mars, Eagle, MATLAB
Communication: Design proposals, technical reports, presentations (large and small audiences)
Languages: English (fluent), Portuguese (native), Spanish (fluent)

Projects

Room Conditioning Automation System Using (Mbed - C++)

- Designed a centralized room conditioning automation system using a STM32F469NI board in Mbed – C++ language with the objective to control the elements around the house and regulating them as the user desired.
- Designed the respective system GUI for the application in the STM32 board display with the respective menus/submenus available for each element required to control and the following information values.
- Implemented the system in a real-world application by designing and printing a double layer PCB board that fitted the board with all the selected hardware components to fulfil the requirements of the system.
- Conducted substantial research and identified the problems in current room automations systems that may jeopardize users' privacy and comfort.
- Created multiple classes, objects, pointers, interrupts, threads and timers and imported some required libraries in order to be able to control automatically/manually the different elements in the system such as temperature regulation, light control, door locks management and curtains adjustment.

Client and Server based Library Management Systems with GUI (Java)

- Created two different applications that consisted on the same idea that is to design a GUI system using AWT and swing libraries to manage available data on an SQLite database.
- Developed UML diagrams for each application, representing how the system communicates and develops in the client-server.
- Designed both client and server divisions of the system and developed them with the objective for these to communicate with each other and exchange necessary information over a TCP network.

Bar Graph Display (C++)

- Created an application using sStream library to read, write or create .csv files to plot a desired bar graph table and counting the total amount of characters to display the graph and to fill the required gaps.

- Implemented features to display the bar graph in a 2-dimension space using ASCII art and an optional save option for the developed graph.

Single-Cycle CPU

- Using System Verilog, it was designed a single cycle CPU.
- Extended the processor design to support more instructions like R-Type, sb, andi, and more.
- Implemented these extended features to the code for every new instruction, modifying crucial module areas such as Datapath, controller, decoders, instruction/data memories and interfaces.
- Created a testbench to inspect all the instructions by checking for possible errors.

Experience / Relevant Coursework

Advanced Computer Architecture: Discussed parallel processing techniques and analysed how these effect the overall performance in its specific areas. Suggested and built a complete computer system for a company and justified all its components according to the required performance needed for specific applications and respective benchmarks. Created an assembly language program to implement a sorting algorithm using MIPS instruction Set.

Agile Development: Cooperated as a team with colleagues from different courses with the objective of completing a project of an automation system where it required to develop front end, back end and required hardware. All of these features were required to be developed with Agile procedure, so as a team leader, I took the responsibility of allocating the appropriate tasks for each element in the group regarding their skills and previous experience. Also, made sure that these met the appropriate quality and deadlines. It was further required to keep version control updated for each section and to plan all the steps and choices needed for a successful project delivery.

Embedded Microprocessor Project: Designed a system that managed a conveyor belt and the surrounding temperature from a medical warehouse using a PIC18F4520 microcontroller. Implemented the login password system with multiple available combinations, coded a temperature regulation section where the user could set the desired temperature and the air conditioner would automatically regulate according the inputted values (using threads) and lastly, using a light sensor, created a production line system that counts passing boxes (using counter interrupts), that when reaching a certain value, would freeze the entire system for a specific amount of time, restarting then the process. Furthermore, designed and tested using Proteus, a simulation schematic of the circuit with all the required side circuits, later with substantial hardware.

Activities

Java Programming: Arrays, Lists, and Structured Data - Duke University (Coursera)	June 2020
Pascal Programming Language – College	May 2019
Cyber Security - Coventry University (advantage module)	December 2019
Photoshop Certification - Coventry University (advantage module)	March 2022