Parth Rajeshkumar Thakkar

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Internships

Embedded Developer - <u>Griden Power - An EV Charger Company</u> (Sept 2022 - May 2023)
As an firmware and hardware developer I have designed IoT part of charger from entirely from the ground up
- designed the printed circuit boards (PCBs) and contributed to the manufacturing process of the chargers, Managed and hosted servers within the AWS (Amazon Web Services) environment. Additionally, I established communication between the chargers and the AWS server using the OCPP and MQTT protocols
- Developed drivers to integrate with other peripherals like touch LCD, Neoway GSM/GPS module

Firmware Developer - <u>Scan point geomatics - Indian Geomatics Company</u> (Oct 2022 - August 2023)
Helped in developing a driver for a custom UHF-RFID board, enabling it to effectively read and write RFIDs over extended distances
- Enhanced the driver by incorporating algorithms that improved its overall performance, Designed and Manufactured full fledge product, including PCB and 3D printing
- Worked on Custom UHF reader, ESP32, Touch screen

Hardware Team - <u>Club Robocon</u> (March 2019 - Sept 2019)
I created bare metal drivers for robot that represented LD college in DD robocon India
- developed drivers for atmega328p for example: I2C, UART, SPI, Rotary Encoder, PID/Motor Driver, USB, LCD, Worked on different boards and softwares like stm32 and RPi and simulated path that will robot take in the competition in MATLAB, calculated PID for motor in MATLAB

Education

Masters of Science in Electrical Engineering	**2023-2025**
University of Colorado, Boulder	
Coursework: Principle of Embedded systems, Embedded Systems Design	*GPA : -/4*

Bachelor's of Engineering in Electronics and Communication	**2017-2019**
L.D. College of Engineering, Ahmedabad	*GPA : 8.67/10*

Skills

Software : C, C++, Assembly, VHDL/Verilog, Python, Docker, AWS, OpenCV, Django Rest Framework, Tensorflow, JavaScript.
Hardware Architectures : ARM cortex M0/M4 Architecture, AVR Architecture, x86 Architecture
Boards : 6052, 8051, MSP430, KL25Z, LPC2148, Stm32f0/f4, Raspberry pi4, ESP32c3, ATMega328p, ATTiny16.
Communication Protocols : USB, UART, I2C, SPI, Websockets, TCP/UDP, IoT, RF, HTTPS.
Tools and IDE : Keil uVision, Git, Eagle, Proteus, KiCad, MATLAB, Postman, MCUXpresso, Microchip Studio, Stm32cubeIDE.
OS : Linux(debian, arch), Windows.
Skills : Logic Analyzer, Oscilloscope, Datasheet/Reference Manual, Function Generator.

Projects

8-Bit CPU : This CPU is composed from basic transistor-transistor-logic, and is capable of executing basic programs such as fibonacci series, addition, subtraction. As an embedded system it is equipped with all necessary core blocks, Program Counter, ALU, Control Unit, LCD for output register, Register, Instruction Register, Control unit, Clock, Instruction decoder, RAM(16 byte)Address Decoder.

Simulator in C++ for 6052 : Simulated 6052 in the C++ that can run programs which we have to hardcode into virtual memory. Also it uses the same opcodes and machine cycle to run the instruction.
Implemented instructions, LDA, LDX/Y, STA, STX/Y, JMP, RTS, JSR, BEQ, CMP, TAX, TAY, NOP to run the given code in the simulator.

Bare Metal RTOS in Stm32f070 : Created Bare Metal RTOS for ARM cortex M0 core , implemented Scheduler Implemented RTOS with, Round Robin way , Cooperative way and Periodic Scheduler, Implemented Semaphores.

IoT Ecosystem : In this project, an IoT platform was developed comprising a website for server-side rendering utilising the Django framework and an ESP32/ESP8266 for client-side rendering. Additionally, this cloud API and an app for communication with the server and an ESP32 was created in the python, Additionally I developed a library to enable communication between all aforementioned components.

Publication

- IoT home Automation from Ground up (IJSR.net)