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Education

Indian Institute of Information Technology, Design & Manufacturing - Kancheepuram
Bachelor of Technology - Electronics Engineering; CGPA: 9.1/10

May 2023
Chennai, India

Relevant Coursework

- Embedded Systems
- Computer Architecture
- Data Networks
- Digital Logic
- Analog Circuits
- Control Systems
- Digital Signal Processing
- VLSI Design

Work Experience

Embedded Systems Intern

Jan 2023 – Apr 2023

Aerospace Engineers Private Ltd. 

Salem, India

- Re-designed the electronics architecture to improve the Autonomous Underwater Vehicle's hardware topology and communications.
- Wrote a bootstrapper that preinstalls the AUV's dependencies in a headless Linux image to streamline the deployment.
- Developed an SPI-based communication link between the STM32 MCU and the Linux SBC to facilitate reliable data transfer.

Research Intern

Jul 2022 – Oct 2022


GSI Helmholtz Centre for Heavy Ion Research 

Darmstadt, Germany

- Worked on improving the timing precision of MCP-PMT detector data acquired through FPGA frontends called DiRICH boards.
- Improved the timing precision of the time-of-flight of particles from 150ps down to 70ps.
- Developed software using CERN's ROOT framework to automate the analysis of huge amounts (2GiB per test) of acquired data.

Junior Embedded Systems Engineer

Dec 2020 – Mar 2021

Dextroware Devices 

Remote, India

- Designed and developed the prototype of a hands-free input device, called Mouseware, for people with upper-limb disabilities.
- Conducted research and development of the prototype and gained experience with Atmel MCUs and RF communications.

Accomplishments

GET_INVolved Fellowship: Fellowship involved doing an on-site summer research internship at the GSI particle accelerator facility.

IIT Madras Summer Fellowship: Received a summer fellowship for doing a research project at IIT Madras.

Robocon 2020: Led a team to develop robots capable of playing robo-rugby which secured 98/100 points at the national level.

Maker Sponsorship: Received sponsorship from DFRobot for my articles and personal projects on electronics.

Projects

Linux SBC ↔ STM32 MCU Communication Link | *C, Python, GNU Make, SPI*

Apr 2023

A hybrid project written in Python(Linux SBC) and C(STM32) to allow an STM32 board and a Linux SBC to talk to each other over an SPI-based communication link. It employs a custom data transaction flow inspired by TCP.

Linux Bootstrapper for NVIDIA SBCs | *Shell Scripting, Linux*


Feb 2023

A fully-customizable framework, written using POSIX shell scripts, for bootstrapping a custom Debian Linux image for NVIDIA boards. It allows reliable, reproducible and hassle-free deployment of the AUV's software stack.

Fit Routine for PANDA Barrel DIRC  | *C++, ROOT, GNU Make, Statistics*

Oct 2022

A C++ routine which uses the ROOT framework, enables rapid analysis of large experimental datasets by processing 64 input streams and generating 2D histograms to derive timing precision statistics for each stream through appropriate cuts and projections.

OLED Display Driver for ATmega328  | *AVR Assembly, I²C, SPI, GNU Make, Python*

Dec 2021

A bare-metal project to play a video on an OLED display by reading data from an SD card. The video data is read from the SD card to a 1KiB frame buffer over SPI and then sent to the display over I2C. It uses an ATmega328P chip and is written purely in assembly.

8-bit Computer  | *Computer Architecture, Digital Logic, Assembly*

Mar 2021

An 8-bit computer spanning 14 breadboards built using discrete digital logic. It follows the Von-Neumann architecture and is based on the SAP-1 ALU processor. It has its own instruction set and is UART programmable.

Skills

Languages: C, C++, Assembly, Python, Go, Shell Scripting / Bash, Verilog

Tools and Platforms: KiCAD, EagleCAD, MATLAB, git, CERN ROOT, GNU Make, Neovim, Linux

Miscellaneous: Firmware Development, PCB Design, Software Development, Automation, Continuous Integration

Extracurricular Activities

Technical Writing: I write about electronics and programming on my blog and I also document my projects on Instructables.

Robotics Club: As the club core, I have organized workshops, conducted sessions and curated events to culminate the robotics spirit.

Vidhai: I developed a website for Vidhai, a non-profit student-run organisation focused on educating underprivileged children.