

MURARI YALAMANCHILI

+1 (413) 466-1757 | yalamanchili.murari@gmail.com | LinkedIn-murari-yalamanchili | Amherst, MA

EDUCATION

University of Massachusetts, Amherst

Master of Science in Electrical and Computer Engineering

Expected May 2025

CGPA.3.8/4.0

Indian Institute of Information Technology, Design & Manufacturing, Kancheepuram

Bachelor of Technology in Electronics and Communication Engineering with Distinction

June 2023

CGPA. 9.01/10

COURSE WORK

Advanced Operating Systems, Design Principles for Low Power Embedded Computing Systems (Thingy 52), Advanced Computer Architecture, Networked Embedded Systems, Microprocessors and Microcontrollers (Intel 8086), Embedded Systems Design (TM4C123GH6PM), Data Structures and Algorithms, Computer Networks

EXPERIENCE

Research Assistant | Dept of ECE, UMass Amherst

Feb 2024 – Present

- Synchronized the time on the STM32L462RE board through RTC, RTOS, SNTP, and NB-IOT Modem modules.
- Established STM32 board-NTP server connectivity using UDP protocol to dynamically synchronize the system clock.
- Conducted drift analysis using SNTP on STM32 board for time accuracy in low-power embedded devices.
- Improved the time synchronization with nano second level precision using timers and bare-metal implementation.
- Compared with other embedded boards like nRF9160 for performance evaluation in diverse embedded applications.

Research Intern | Dept of ECE, IIITDM kancheepuram

May 2022 – Oct 2022

- Integrated waterproof sensors (temperature, humidity), and IMU with STM32F103 for refrigerator Data collection.
- Developed a system predicting door opening patterns using ML, custom control, and compressor systems with motors.
- Achieved 8% more savings than current refrigerator technology and 24% more than older (on-off) technology.

Embedded Systems Engineer | MaRs Rover Society IIITDM

Sep 2021 – Mar 2022

- Integrated driver with encoder motor and interfaced the rover system with the Linux-based ROS environment.
- Utilized the TEENSY 2.0 Microcontroller to enhance the rover steering system to comply with competition rules.

PROJECTS

Multi-Threaded Web Server | C++, Socket Programming, Linux, Python

Feb 2024 – May 2024

- Created a multi-threaded web server with client, capable of managing HTTP requests for both web-pages and images.
- Conducted a performance analysis against the Apache HTTP Server, focusing on throughput and latency metrics relative to varying request rates.
- Achieved good performance shown by plots using Httpperf, ApacheBench, and Python scripts for benchmarking data.

Linux-based Thread Library | C++, Linux, Mutex, Debugging

Feb 2024 - April 2024

- Developed a user-level thread library enabling concurrent execution of various threads in diverse applications.
- Developed a concurrent disk scheduler using SSTF algorithm in C++ that handles I/O requests and scheduling.
- Implemented diverse test application codes to thoroughly debug and optimize the existing thread library functionalities.

Virtual Memory Manager and Cache Simulator | C++, Linux, TLB, Computer Architecture

Nov 2023 - April 2024

- Engineered 64-bit virtual memory with TLB, Page Table, mapping to 32-bit physical addresses for efficiency.
- Designed a virtual memory manager (MMU) that accesses simulated TLB and page tables for virtual to physical address translation. It handles read and write faults, address space creation and destruction for application processes.
- Designed high-performance multi-level cache system with Clock (LRU) policy and Write-back cache coherence.
- Seamlessly integrated with the virtual memory subsystem in Linux for overall system performance and efficiency.

Warehouse Fire Safety System | C, ADC, Keil µVision, LPC2148

Jan 2022 – April 2022

- Developed a system utilizing LPC2148(ARM7TDMI-S) using Flame sensor, Gas and Temperature Sensors.
- Implemented Temperature Sensor Integration through ADC pins on Microcontroller for accurate monitoring.
- Utilized UART-based Serial monitor to monitor various cases of the fire safety system.

Smart Concrete Curing System | C, Bluetooth Module, GUI

Jan 2022 – April 2022

- Created a system using Arduino ecosystem with temperature, moisture, and humidity sensors to spray on concrete.
- Utilized a Bluetooth module and developed a GUI to show real-time data from the sensors.

TECHNICAL SKILLS

- **Languages:** C, C++, Assembly, Python, Verilog
- **Microcontrollers:** STM32, TM4C123, LPC2148, nRF9160, TEENSY 2.0, Nordic Thingy52, Arduino
- **Protocols:** UART, SPI, I2C, CAN, UDP
- **Tools/Frameworks:** Keil µVision IDE, STMCubeIDE, GIT, GDB, Valgrind, DOS Box, Git Bash, Wireshark, MATLAB Simulink, LabVIEW, PCB Design, Machine learning
- **Operating Systems:** RTOS, Linux, Windows

CERTIFICATIONS

- Foundation of Embedded Systems with ARM Cortex and STM32 | *Udemy* Currently enrolled
- Introduction to Internet of Things and Embedded Systems | *Coursera* Jan 2022 – Feb 2022
- Analyzing Data with Python | *edX* May 2020 – July 2020