Aniket Dhere

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Education

University of North Carolina at Charlotte — Charlotte, NC, USA
Master of Science Electrical Engineering, *GPA: 3.5* — Aug 2019 - May 2021

Savitribai Phule Pune University — Pune, India
Bachelor of Engineering Electronics and Telecommunication, *GPA: 61.99* — Aug 2014 - Dec 2018

Experience

Nikola Corporation — Santa Ana, CA
Battery Systems Application Engineer — Feb 2024 - Oct 2024

- Spearheaded the development of the next-gen Battery Management System (BMS) using MATLAB, aimed at deployment in Fuel Cell Electric Vehicles and Battery Electric Vehicles.
- Tested the features of micro-controller like GPIO, ADC, PWM, SPI, & CAN to make sure the board is ready for the application, with the right pins configured.
- Wrote multi-threaded RTOS's application layer and integrated with the drivers.
- Reviewed software requirements, ensuring alignment with functional safety (FuSa - ISO26262) standards, system specifications, and architectural guidelines.

Projen Technology Solutions LLP — Pune, India
Automation Engineer — Nov 2023 - Jan 2024

- Developed an OpenAI-powered wrapper to automate mechanical piping design by extracting and processing data from technical drawings, enhancing efficiency and accuracy.

Romeo Power — Vernon, CA
Embedded Software Engineer — Jul 2021 - Jun 2023

- Enhanced the FreeRTOS-based Battery Management System (BMS) by delivering production-grade releases with performance optimizations and bug fixes, ensuring stability and reliability for critical applications. Error-proofed the pipeline to ensure right firmware is generated for clients.
- Engineered an innovative alert system within the Battery Management System (BMS) to detect potential thermal venting events; monitored performance under varied environmental conditions, ensuring compliance with industry standards; while keeping the response time under 2 minutes.
- Refactored existing drivers to incorporate ADC based temperature sensor that communicated through SPI protocol, transferred data using inter-task communication and broadcasted message using CAN.
- Collaborated with the systems team to develop software and documentation compliant with ISO 26262 and ASPICE standards (ASIL Level C), ensuring adherence to industry benchmarks for functional safety and quality.
- Authored comprehensive unit tests to validate firmware functionality and ensure compliance with system requirements.

Soil Agritech Private Limited — Bangalore, India
Embedded Software Intern — Feb 2019 - Apr 2019

- Prototyped a microcontroller development platform based on Texas Instruments' MSP430, aimed at simplifying development for school projects and educational purposes.
- Interfaced multiple sensors, including pulse/heartbeat sensors, fingerprint sensors, temperature sensors, MQ-3 gas sensors, and 3-axis accelerometers, with the U8g2 OLED display, enabling real-time data collection and visualization. Developed a science fiction Space Invader game on the U8g2 OLED screen, implementing joystick controls and enhancing interactive learning for educational projects.

ABU Asia-Pacific Robocon *Vishwakarma Institute of Information Technology* — Pune, India
Technical Lead of Robotics Club — Sept 2015 - May 2018

- Designed a 300W switch-mode power supply alongside MOSFET-based motor driver with PWM speed control, to handle high currents using Altium, and Proteus.
- Simulated the power electronic circuits to ensure predicted outcome, using Proteus software.
- Built data acquisition circuits and integrated sensors with microcontrollers (8bit, 16bit, 32bit) for precise real-time control.
- Documented the circuits and the reasoning behind the decision taken.

Projects

AI Smart Home *Python, TensorFlow, Node.js, React* Jul 2024 - Present

- Improved a smart home automation system that integrates advanced AI-driven person detection and mood-based ambiance control.
- Deployed a web-based dashboard using Node.js, React, and Nginx server for real-time monitoring and control of the system.

Music Genre Recognition *Python, TensorFlow* Sept 2020 - Dec 2020

- Trained multi-architectural Deep Neural Networks to solve the problem of genre classification.
- Used TensorFlow to train the sampled music dataset (GTZAN) using Long Short-Term Memory RNN.

Posture Detection *C++, Convolutional Neural Networks (CNN)* Apr 2021 - May 2021

- Detected whether a person is sleeping, standing, walking or jumping using 3-axis accelerometer and convolutional neural networks on low power Arduino nano 33 BLE micro-controller.

Accident Detection For Elderly *C, nesC* Mar 2021 - May 2021

- Implemented a fall detection application in TinyOS, leveraging multitasking to transmit sensor data to the base station via multihop routing, within 100ms.

Modified xv6 kernel for efficient memory management *C* Jan 2020 - May 2020

- Cross-complied unix/linux based xv6 operating system for RISC-V architecture.
- Coded lazy page allocation, Copy-on-Write Fork for xv6, user-level threads and alarms, filesystem, added support for UDP network sockers to xv6.

Custom Linux Shell *C* Nov 2019 - Jan 2020

- Wrote native linux commands from scratch like ls, pwd, cd, rm using system calls.

Secure Encryption using ARM TrustZone Secure Boot Technology *C++* Oct 2019 - Nov 2019

- Programmed Xilinx Zynq 7000 FPGA to use 256-bit AES encryption engine to encrypt and decrypt input string.
- Encrypted plain text input from the non-secure world and passed back the encrypted string.

Smart Wheel Chair *C, Altium, Proteus* Mar 2017 - May 2017

- Designed a wheelchair capable of carrying up to 80kg, featuring bidirectional motor control and speed regulation using a MOSFET-based driver, with wireless operation via mobile and HTTP protocols.

Skills

Programming Languages:	Embedded C, C++, Python, nesC, Matlab, Simulink
Operating Systems:	Linux, Embedded Linux, uCosII, xv6, tinyOS, freeRTOS
Micro-controllers:	Infineon Triboard TC389, TI's TMS570, MSP430, ARM Cortex M3 LPC1768
Instruments & Tools:	Oscilloscope, PCAN explorer, JTAG, gdb, Logic analyzer
Documentation & Compliance:	LaTeX, Doxygen, JIRA, Jama, ISO26262, ASIL, Misra C/C++, Git, gitlab
Communication Protocols:	SPI, I2C, CAN, CAN-J1939, UART, HTTP, REST API, GPIO, MQTT, UDP
Machine Learning Frameworks:	Tensorflow, YOLO v9, FaceNet512
Web Development:	HTML, CSS, Javascript, Node.js, Nginx, Let's Encrypt, tailwindCSS, React