SUJAN DUMARU

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SUMMARY

Embedded Software Engineer with 4 plus years of experience building production grade firmware and embedded systems in C and C++ for microcontroller based platforms. Strong computer science foundation with hands on experience across the full software lifecycle, from design and implementation to testing, debugging, and automation. Proven track record of developing reliable, maintainable embedded software under real world hardware constraints. Experienced in creating Python based automation and validation tools to accelerate testing, improve coverage, and support equipment communication. Known for learning fast, asking the right questions, and turning complex system problems into clean, dependable solutions.

SKILLS

- **Engineering Skills**: Arduino, Block Schematic Designing, Device Driver development, LaTeX, Oscilloscope, Quartus, Soldering
- **Tools and Utilities**: AGILE, CA Rally, Code Collaborator, CI/CD, Docker, Git, GitHub, GitKraken, GitLab, Google Test Framework, Jenkins, MS Office, QGIS, Qt Creator, RTOS, Froglogic Squish, Vagrant, Valgrind, Visual Studio Code, Wireshark, CANalyzer, Postman, Rest APIs, Azure DevOps, Databricks, Azure Data Factory, Azure Synapse, Azure Pipelines, Jupyter
- **Protocols**: CAN, MQTT, Network Protocols (TCP/IP, Ethernet, UDP, HTTP), Wi-Fi, Google Protobuf
- **Operating Systems**: Linux/Unix, Mac, Ubuntu, Windows, RTOS, Embedded Linux
- **Programming Languages**: Assembly, C, C++, CMake, Debugging, Java, Python, Shell Scripting, SQL, Verilog
- **Circuit Modeling & Simulation**: Code Composer Studio, LT Spice, MATLAB

WORK EXPERIENCE

L&T Technology Services **Nov 2021 - Present**
Embedded Software Engineer *Plano, TX*
Client: John Deere (Project: Gen4 & Gen5 Command Center Display Development)

- Designed and implemented C++ software modules for Gen4/Gen5 Command Center displays, integrating precision agriculture features such as AutoTrac and Section Control with embedded Linux platforms.
- Developed and integrated virtual equipment modules within John Deere's Equipment 2.0 ecosystem, enabling the operating system to simulate and manage digital representations of physical machinery.
- Developed and optimized import/export modules in the John Deere OS, improving reliability of large data transfers and cutting export time for heavy files by 40 percent.
- Worked on multiple equipment plugins including Rainier, Trango, Everest, and Denali that interface with John Deere machines such as Sprayers, Combines, and Spreaders, enhancing system compatibility and feature modularity across Equipment 2.0.
- Worked with cloud and offboard teams to synchronize equipment and implement data to cloud platforms, including configuration parameters, operational characteristics, and metadata used for simulation, diagnostics, and fleet level analysis.
- Collaborated with cross-functional teams to integrate software components, ensuring seamless communication and optimal system performance.
- Developed unit tests using Google Test and UI verification scripts with Squish, which increased functional coverage and caught regressions early
- Enhanced team productivity and software reliability by integrating pair programming into the development process, leading to faster delivery of high-quality applications.
- Conducted comprehensive evaluations of ARM and Intel Atom processors, ensuring seamless integration and improved performance in embedded systems.
- Enhanced user interface components using the Qt framework to improve usability and accessibility across embedded display applications.
- Parsed and analyzed debug logs involving system messages and CAN protocol communications to support diagnostics and root cause analysis.
- Participated in sprint reviews, code reviews, and continuous integration efforts to maintain quality and stability.

- Built automated test and simulation scripts to replicate communication between multiple embedded platforms, accelerating validation and lab evaluations.
- Maintained strict coding guidelines as per the C++ secure coding standards adopted by the team.
- Conducted code reviews to maintain high-quality standards throughout the software lifecycle, reducing defects and maximizing efficiency.
- Managed source code version control and contributed to best practices documentation, fostering a collaborative team environment.

UTA IDIR Lab **Aug 2020 - Aug 2021**
Undergraduate Research *Arlington, TX*
- Built a programmable TV remote with Arduino Uno and Video Experimenter Shield, coding in C/C++ on Linux.
- Developed Python/C++ automation scripts for data capture, enabling PhD researchers to collect caption data in real time.

EDUCATION

University of the Cumberlands **Aug 2024 - Aug 2025**
Master of Science, Computer Science *Williamsburg, KY*
- **GPA:** 4.00

University of Texas at Arlington **Aug 2019 - Aug 2021**
Bachelor of Science, Computer Engineering *Arlington, TX*
- **GPA:** 3.96

PROJECTS

AUTOMATED HOME BREWING SYSTEM
- Senior Design project design to implement automation in the world of home brewing system with the help of micro-controllers.
- Can control the heating and pumping system based on the temperature of the contents inside the brewing vessels.
- Smooth user interface between hardware and software to control temperatures of the kettles.
- Hardware Used: Raspberry Pi, ESP32, Relays, Temperature Sensor Probes, Heating Elements, Pumps, etc.

IOT SYSTEM
- Designed a low-cost, power-efficient IoT solution using Texas Instruments microcontrollers and transceivers.
- Implemented custom messaging protocol with MQTT broker integration and evaluated system tradeoffs between wireless (nRF24L01) and wired (ENC28J60 Ethernet) communication.
- Hardware Used: TM4C123GH6XL, ENC28J60 ethernet interface, nRF24L01 2.4 GHz wireless transceiver, MQTT protocol for internet, custom protocol for bridges.

KNIGHT RIDER FLASHER
- Use of Field Programmable Gate Array to design a flasher.
- It is used to flash 10 LEDs in a continuous back and forth pattern with different speeds.
- Modules like Up/Down Counter, Clock Divider, On/Off toggle are used.
- Hardware and Skills Used: DE1-SoC Board, Module Instantiation and Schematic Designing.

ARITHMETIC LOGIC UNIT (ALU)
- Construction of 8-bit four function ALU using FPGA and Verilog programming which is used for basic mathematical operations like addition, subtraction, multiplication, and division.
- Hardware Used: DE1-SoC Board