RUDRA ARYAN POTLURI

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PROFESSIONAL SUMMARY

Innovative and detail-oriented Embedded Systems Engineer with a strong foundation in hardware-software co-design. Proven track record in developing and optimizing embedded systems, with extensive hands-on experience in microcontroller programming, FPGA development, and system-level integration. Adept at managing complex projects and delivering robust engineering solutions in dynamic environments.

EDUCATION

- Bachelor of Computer Engineering – University of Victoria **May 2024**

SKILLS

- Programming Languages – *C, C++, Python, MATLAB, HTML, JavaScript*
- Embedded Systems – *ARM Cortex, Microcontroller Programming, Embedded Debugging (JTAG, Logic Analyzers)*
- Communication Protocols – *I2C, SPI, UART, CAN*
- Hardware Design – *VHDL, Verilog, KiCad, Solidworks*
- Robotics – *Arduino, Raspberry Pi*
- Version Control – *Git, Bitbucket*
- Other Tools – *Microsoft Office, Adobe Creative Cloud Suite*
- Methodologies – *Agile, Scrum*
- Technical Documentation – *Technical Writing, Reporting*

EXPERIENCE

HYPERCHARGE NETWORKS, Vancouver, BC – Product Management Intern ***Sep 2023 – Dec 2023***

- Configured EV chargers and collaborated with external vendors on the qualification of new charging technologies.
- Conducted site visits for hands-on troubleshooting and maintenance of chargers, ensuring high service quality.
- Enhanced lab and office infrastructure, optimizing space and resources for improved operational efficiency.
- Established robust technical documentation practices to support ongoing product development and team training.

MOTOROLA SOLUTIONS, Vancouver, BC – Systems Engineer ***Sept 2021 – Apr 2022***

- Recommended, selected, configured, and qualified servers for deploying Avigilon's Control Center.
- Measured and documented the performance of various system components, including graphics, network, memory, IO, and disk.
- Setup and maintained complex test environments to qualify OS image releases.

JBS POWER SYSTEMS, India – Testing Engineer ***Jan 2021 – Apr 2021***

- Performed testing, evaluation, and quality control of circuits in SMPS chargers.
- Applied testing procedures such as load test, aging test, and inspection test on assembled PCB boards.

DMZ SANDBOX BASECAMP, Toronto, ON – Participant ***Jul 2018 – Aug 2018***

- Selected to attend Ryerson University's startup incubator DMZ from high school.
- Gained exposure to the entrepreneurial setting by networking with professionals from companies like Facebook, Google, Shopify, and Telus.
- Learned about business models, customer acquisition, and funding opportunities.
- Co-founded FOCUS, a virtual workspace to enhance students' time management, ethics, social skills, and technological expertise.
- Developed communication and presentation skills by pitching ideas to various investors.

PROJECTS

AUTOMATED SORTING MACHINE – MECH 458 Project – **Project Link** ***Jan 2024 – Mar 2024***

- Engineered a conveyor-based inspection system with DC and stepper motor control for dynamic item sorting.
- Designed integration of optical, and reflective sensors for real-time material and visual characterization.
- Implemented C-based control algorithms for system operations including sorting logic, pause, and ramp-down functionalities.
- Optimized system circuitry and software, achieving a high system performance index in class demonstrations.

AUTOMATED BEVERAGE MAKER – Personal Project – Project Link ***Jan 2024***

- Engineered an automated cocktail maker using a Raspberry Pi, interfacing with peristaltic pumps for precise liquid dispensing.
- Developed a user interface with Kivy in Python for selecting drinks, featuring a dynamic loading screen with animation to enhance user interaction.
- Implemented GPIO control in Python to manage multiple motors simultaneously, optimizing the drink preparation process.
- Incorporated system-level features like an inactivity timeout to revert to a screensaver, enhancing both usability and energy efficiency.
- Utilized threading to ensure responsive UI operations while executing backend tasks like motor control and timer management.

SMART BUOY COMMUNICATION INTERFACE – ECE 356 Project – Project Link ***Sep 2022 – Dec 2022***

- Designed and implemented a communication interface project using Arduino to collect temperature, humidity, and water level data from sensors.
- Transmitted sensor data using radio waves on a 315 MHz frequency and received the data using an ESP32 microcontroller.
- Developed a web server on the ESP32 to display sensor values on a webpage, including graphical elements to enhance user experience.
- Demonstrated proficiency in sensor integration, wireless communication, and web development to create a functional and user-friendly project.

SURVEILLENCE DRONE – Personal Project – Project Link ***Mar 2017 – Apr 2017***

- Designed and built a surveillance quadcopter.
- Researched and learned about aerodynamics, Raspberry pi, Arduino, and various control systems for a drone.
- Translated research and learning into a final working product.

SMART HOME SYSTEM – Personal Project – Project Link ***Jan 2017 – Feb 2017***

- Designed a smart home system using Arduino that can be connected to household electronic appliances, allowing users to control these appliances using a mobile app.
- Learned Arduino and gained an understanding of electrical systems.
- Programmed an android app connected to the Arduino, which gave me a better perception of hardware and software integration.

MATRIX INVERSION IN FIXED POINT – SENG 440 Project – Project Link ***May 2023 - Aug 2023***

- Developed an optimized matrix inversion algorithm using fixed-point arithmetic tailored for embedded systems.
- Implemented matrix inversion for an 11x11 matrix on an ARM-based virtual machine.
- Employed Gauss-Jordan elimination with pivoting and fixed-point arithmetic to enhance performance and precision.
- Optimized computational efficiency using techniques such as power-of-2 scaling factors, 16-bit and 32-bit integer usage, and NEON intrinsics for parallel processing.
- Achieved a significant reduction in execution time and improved the suitability for resource-constrained embedded platforms.

DIGITAL IMAGE PROCESSING SYSTEM – ECE 441 Project – Project Link ***July 2023***

- Developed a digital image acquisition, display, and processing system using VHDL on an FPGA board.
- Implemented VGA display control, including generating sync signals and converting digital RGB values.
- Connected a digital camera for real-time image acquisition and display.
- Designed image processing functions like greyscale conversion and Sobel edge detection using VHDL.
- Added switch-controlled functions for various image processing modes on the FPGA.

DIFFIE-HELLMAN HW/SW CO-DESIGN – ECE 466 Project – Project Link ***May 2023 - Aug 2023***

- Enhanced the Diffie-Hellman key exchange protocol by implementing a hardware-software co-design approach.
- Offloaded computationally intensive tasks to a custom hardware module designed and simulated using SystemC.
- Developed a simple handshaking protocol for SW-HW synchronization using enable and done signals.
- Modified the software implementation to interface with the custom hardware, significantly reducing computation time for the *'NN_DigitDiv()*' function.
- Achieved substantial performance gains, demonstrating the potential for improved secure communications through hardware acceleration.