Jatan J. Pandya

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SUMMARY

Software engineer with experience in engineering consultancy, delivering full-stack applications, C/C++ firmware, and scalable AWS cloud architectures. Successfully led 6+ product development projects from prototype to production across consumer, IoT, and medical domains. Proven track record of problem-solving in both autonomous and collaborative environments, contributing to innovative projects that have won multiple competitions.

EDUCATION

University of Massachusetts Amherst **09/2023**

Bachelor of Science, ***Computer Engineering***

Bachelor of Science, ***Computational Linguistics***

- Clubs: Vice President of Institute of Electrical and Electronics Engineers (IEEE) UMass Amherst Chapter
- Awards: $14,000 Chancellors Award
- Selected Coursework: Algorithms Design, Machine Learning, Digital Signal Processing, Embedded Systems

SKILLS

- **Programming Languages:** C/C++, Python, MATLAB, JavaScript
- **Embedded Development**: Microchip SAM, STM32, FreeRTOS, ROS, Logic Analyzer, Oscilloscope
- **Software Development:** Linux OS, bash scripting, Git, Object-Oriented Design (OOP), Agile Development
- **Full Stack:** Amazon Web Services, Flask, Bootstrap, PostgreSQL, REST API
- **Protocols:** I2C, SPI, UART, GPIO, ADC/DAC, 802.11 WiFi, LoRa, UWB (Ultra-wideband)

WORK EXPERIENCE

QuireTech Engineering Consultants LLC **Cresskill, NJ, USA**

Software Engineering *09/2023 – Present*

Firmware Engineering:

- Developed C firmware for a consumer facial skin micro-needling therapy device, successfully delivering a robust solution that is currently in mass production, within 7 weeks of prototyping phase.
- Engineered real-time, event-driven, low-latency firmware and custom drivers on an ARM-Cortex based microcontroller, managing multiple peripherals (buttons, rechargeable battery, motor, LEDs) to deliver a seamless UX for customers.
- Designed a power-efficient battery management algorithm utilizing sleep and idle modes, reducing power consumption by 80% and extending device operation time to 12+ hours on a single charge.

Full Stack Development:

- Deployed a scalable AWS architecture for a reusable cup IoT bin prototype, aimed at eliminating single-use plastic cups at large-scale outdoor events and in coffee chains.
- Designed infrastructure for uplink, downlink data exchange and storage across 30 AWS Sidewalk-enabled bins within a 0.25-mile radius, facilitating transfer of both on-site user-generated and remote over-the-air (OTA) update data.
- Implemented fault-tolerant firmware in C using the ESP-IDF framework, ensuring reliable AWS IoT Core connectivity via local Wi-Fi in regions without AWS Sidewalk support and as a backup during gateway failures.
- Developed a fleet management dashboard using ReactJS, Flask, and AWS (DynamoDB, Amplify, Cognito), providing access to device health, status, GPS, and other telemetry data.

Software Development:

- Conceived an Electrocardiogram (EKG) simulator device for a medical client, enabling sales associates to effectively demonstrate their state-of-the-art cardiac monitor product at conferences and sales pitches.
- Devised a web application with a C++ backend and HTML/CSS/JS frontend, featuring a local web server for file management and custom dataset uploads, allowing associates to upload new on-site, improving flexibility.
- Upgraded RPi-based prototype to ESP32, reducing per unit cost by 93.33% while enhancing the capabilities of the unit.

PROJECTS

CardVerse – An Automated Magic: The Gathering Card Authentication and Sorting System **Amherst, MA, USA**

Software Engineer *09/2022 – 05/2023*

- Built a fully automated MTG card inventory solution, using machine learning, image processing, and mechatronics, a unique system without comparable solution in the market.
- Implemented a multi-state system software architecture in Python, integrating Nvidia Jetson and Raspberry Pi to control a 3-axis robotic arm, 2 cameras, weighing scale, and a lighting chamber, enabling precise card handling and examination.
- Designed a machine learning and data analysis pipeline using YOLOv8 to label, annotate, and train a custom card dataset, achieving 97% accuracy in detecting scratches, bends, dents and other artifacts on cards.
- Implemented image processing and pattern matching algorithms using Python (OpenCV, numpy) replicating industry-standard card authentication tests and achieving 99% accuracy on unseen cards.
- Secured $7,000 in prize money at the UMass 2022-2023 Innovation Challenge, an inter-collegiate competition with 10+ teams.