Dhruv Varshney

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EDUCATION

B.S Computer Engineering, San Jose State University (President's Scholar 22-23) Expected May 2025

Relevant Coursework: Electronics for Embedded Systems, Digital Design, Microprocessor Design, Computer Networks, Data Structures & Algorithms, Advanced Algorithm Design, Software Engineering 1, Computer Architecture, Operating System Design, Circuit Theory & Analysis.

Programming Languages: Embedded C**,** C++**,** Python**,** Linux, Shell**,** Assembly Language
Hardware Design: Verilog, Circuit Design, PCB Design, SoC Design, Analog Design, Low Power Design, RTOS, Debugging
Embedded Systems & Communication Protocols: TCP/IP, CAN, LIN, SPI/ UART, I2C, IPC, GPIO, PWM, Bluetooth LE
Tools: Git, JIRA, Jenkins(CI/CD), OrCAD, Altium Designer, Oscilloscope, MATLAB, JTAG, Simulink, LTSpice, EDA

PROJECTS & RESEARCH

SCOOTSENSE Research Project

- Conducting research with a professor on the application of **Embedded Systems** & **Machine Learning** to advance road safety for electric scooters in downtown and urban areas.
- Integrated **Raspberry Pi 4B** with BeiTian-180 **GPS**, **Pi Camera** module, and GY-521 **gyroscope/accelerometer** sensors into electric scooters to create a data acquisition framework.
- Developing **deep learning** models, utilizing **CNNs** for image-based hazard detection and **RNNs** for motion pattern analysis, using **TensorFlow** and **PyTorch**, to enhance urban road safety.
- Designing a user-friendly **real-time** dashboard for rider alerts and driving adjustments.

TI-RSLK Self-Driving Maze Edition Robot

- Built an autonomous-driving robot capable of navigating mazes using **IR & bumper sensors** to detect turns and walls.
- Designed a **PWM & SysTick ISR** using **ARM** TI-MSP432 **Microcontroller** and utilized H-Bridge **Motor Drivers** to adjust power delivered to DC motors.
- Designed a **Free Real-Time Operating System(RTOS)**, that detects collisions & mitigates them using ISR.
- Interfaced Nokia 5110 LCD using **SPI communication** protocol.

IBM Software Good Tech Scholar Program (Visit Ease)

- Developed a website to identify & address the issue of rising poverty by locally connecting donors to the people in need.
- Deployed **ReactJS** & **AngularJS** web app on **Kubernetes** & IBM cloud that streamlines the process of donation by connecting low-income users with local donors and food banks.
- Designed a personalized UI using HTML, CSS, **JavaScript** with user authentication and recommendation system feature using **MySQL** and **AWS** database.

EXPERIENCES

Institute of Electrical and Electronics Engineers(IEEE) June 2022 - Present
Vice President

- Led a board of 15 officers as Vice President of IEEE, overseeing project/events, membership, and marketing committees. Successfully implemented strategic initiatives that revitalized in-person attendance, increasing active membership to over 100 members.

Associated Students
Chief Financial Officer/Controller June 2023 - June 2024

- Developed comprehensive investment policies and strategies for effectively managing a **$6 million** reserve fund, ensuring financial stability, and maximizing returns.
- Directed the creation and management of a **$9 million** annual budget, funded by student fees, ensuring optimal allocation of resources, and promoting transparency in financial planning.

Director of Sustainability Affairs June 2022 - June 2023

- Advocated to the California State Senator, CSU Chancellors & City Council to provide **9,000** commuter students free public transport across all 24 Bay-Area transit agencies. (Read article here)

CERTIFICATIONS & LEADERSHIP

- IBM Introduction to Cloud
- IBM Enterprise Design Thinking Practitioner
- Mastering Data Structures & Algorithm using C & C++
- **Tau Beta Pi** – Public Relations Officer
- **Surface Mount Technology Association** - Secretary