Vishrudh GK

HSR Layout, Bengaluru — **vishrudh15@gmail.com** — +91 99425 96436 — **Portfolio**

EDUCATION

Vellore Institute of Technology, Vellore	**2023 – Present**
B.Tech — Electronics and Communications Engineering	**CGPA: 9.11**

TECHNICAL SKILLS

VLSI & Digital Design:	Digital Electronics, CMOS Fundamentals, Static Timing Analysis (STA), Signal Integrity, FSM Design, Clocking Concepts
Hardware Architecture:	High-Voltage Systems, Mixed-Signal Design, ADC/DAC Interfaces, Battery Management Systems (BMS), PCB Design (Multi-layer)
Protocols & Interfaces:	SPI, I2C, UART, isoSPI, CAN Bus
Programming:	Embedded C/C++, Python, C# (.NET MAUI), Verilog (Basic)
Languages:	English, Japanese, Telugu, Kannada, Tamil, Hindi

EXPERIENCE

Team Ojas Racing — Formula Student   **2024 – Present**

Vice-Captain & Electronics Head

- **System Architecture & Validation:** Led the architectural design of the vehicle electronics network, emphasizing reliability, redundancy, and safety-critical validation using FMEA methodologies.
- **Protocol Integration:** Integrated High-Voltage (HV) and Low-Voltage (LV) subsystems, managing timing constraints, communication robustness, and signal integrity across distributed nodes.
- **Design Reviews:** Conducted schematic and PCB layout reviews enforcing DFM/DFA guidelines, reducing hardware re-spins and improving first-pass success.
- **Mentorship:** Mentored junior engineers in circuit analysis, debugging strategies, and technical documentation.

KEY PROJECTS

Battery Management System (BMS) — Master & Slave Architecture

- **High-Voltage System Design:** Engineered a modular BMS for a **600V, 3P140S battery pack**, ensuring strict isolation, safety compliance, and protection logic for high-voltage operation.
- **Robust Communication Protocols:** Implemented **isoSPI** for differential daisy-chained communication across 140 series cells, achieving high data integrity in electrically noisy environments.
- **Embedded Firmware & State Machine Logic:** Designed, developed, and tested C/C++ firmware (Arduino and STM32) using structured FSMs for real-time over-voltage/under-voltage fault detection, thermal monitoring, and comprehensive error handling.

High-Precision Mixed-Signal DAQ System   **Ongoing**

- **Mixed-Signal Design:** Designing a precision data acquisition system using a **32-bit Sigma-Delta ADC**.
- **Signal Integrity:** Optimized PCB stack-up and routing to minimize noise floor, mitigate crosstalk, and manage thermal drift for high-fidelity signal capture.

Embedded Systems & Perception

- **Neuromorphic Computing (SNNs):** Conducting comparative research between Spiking Neural Networks (SNNs) and traditional Deep Learning models; analyzing metrics such as energy efficiency and inference latency for resource-constrained embedded applications.
- **RC Car with Human Recognition:** Implemented a YOLO-based object detection pipeline integrated with real-time motor control loops, optimizing inference latency on embedded hardware.
- **Remote Multi-Parameter Monitor:** Developed a real-time OCR system to digitize legacy display data, enabling remote telemetry via a cross-platform .NET MAUI application.

CERTIFICATIONS & AWARDS

Certifications:	DGUV 209-093 3E (High-Voltage Safety)
Awards:	1st Prize: VIT Yantra Hackathon
	2nd Prize: Apollo Solvathon (THIT - International Conference)
	National Finalist: V-Guard Big Idea