Varun S. Jain

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ACADEMICS

B.S. Computer Engineering with Honors – May 2025, Iowa State University
GPA: **3.99** / 4.00

Honors: Summa Cum Laude; Dean's List, May 2025

Relevant coursework: CPRE 5810: Computer Systems Architecture, CPRE 5870: Hardware Design for Machine Learning, CPRE 3810: Computer Organization and Assembly-Level Programming

RESEARCH EXPERIENCE

Honors Research Student, *Department of Electrical and Computer Engineering* – Iowa State University

Advisor: Dr. Henry Duwe · Oct 2024 – May 2025

Project: Neural Network Acceleration for Pervasive Extreme Edge Intelligence

- Designed and deployed quantized neural networks on the MSP430FR5994 microcontroller for CIFAR-10 image classification under strict energy and memory constraints.
- Extended TensorFlow Lite Micro by implementing a custom **Per-Channel Mean** operator, enabling support for missing arithmetic operations in quantized inference.
- Evaluated multiple NAS-generated architectures (Mean, Non-Mean, and Alternate) to optimize the **accuracy-energy tradeoff** for extreme-edge devices.
- Conducted detailed measurements of inference **latency, memory footprint, and energy consumption**, identifying the Int8 Alternate model as the most efficient.
- Presented findings at Iowa State University's *Honors Poster Presentation* (May 2025); poster available at vsjain2004.github.io.

TEACHING & MENTORING EXPERIENCE

Teaching Assistant, *Computational Perception* (CPRE 5750) – Iowa State University (Spring Semester 2025)
- Developed and graded assignments; held office hours to assist students with projects and coursework

Teaching Assistant, *Digital Logic* (CPRE 2810) – Iowa State University (Fall Semesters 2023 and 2024)
- Led labs and recitations, created new lab modules, and prepared and graded exams

Tutor – Iowa State University (Spring Semester 2023)
- Tutored students in *Digital Logic* (CPRE 2810) and *Linear Algebra* (MATH 2070)

AWARDS AND HONORS

- **Dean's List (Dec 2024)**
- **Dennis and Marlys Thovson Scholarship (2024)**
- **Top 2% in Engineering (May 2023, Dec 2023, May 2024)**
- **Cima Scholarship in Electrical and Computer Engineering (2023)**
- **Early Achievement in International Studies** (**2023**)

TECHNICAL PROJECTS

Computer Architecture & Hardware Design
• *Multiply-Accumulate Design Optimization* (Nov 2024 – Dec 2024): Designed low-power, high-throughput MAC units in VHDL; compared designs on FPGA for energy-throughput efficiency.
• *Instruction Set Architecture Examination* (Nov 2024 – Dec 2024): Analyzed RISC vs. CISC ISA trade-offs based on Wulf's "*Compilers and Computer Architecture*."
• *CPU Design* (Aug 2023 – Dec 2023): Built single-cycle and pipelined MIPS processors; demonstrated functional correctness and speedup.
• *Custom 8-bit CISC CPU Design* (Nov 2022 – Present): Developed and iteratively improved Verilog-based CISC CPU; ongoing v3 provides additional functionality.

Machine Learning & Embedded Systems
• *Emotion Classification Model* (Feb 2025 – May 2025): Built a neural network for emotion detection in text using TensorFlow; explored 40+ lightweight & more balanced architectures to optimize accuracy.

Systems Design & Applications
• *Course Management Application* (Aug 2024 – May 2025): Developed a full-stack web app for managing Iowa State's COMS 3090 (Senior Design Project, advised by Dr. Simanta Mitra).

INDUSTRY/INTERNSHIP EXPERIENCE

UHPC India Pvt. Ltd. (Jun 2025 – Present)
- Shadowed the Managing Director in technical, administrative, and strategic meetings.
- Automated sales data aggregation by product type, client, and year using SQL.

TECHNICAL SKILLS

- **Hardware Description Languages & Tools:** VHDL, Verilog, Intel Quartus Prime, Vivado, ModelSim
- **Programming Languages:** Python, Java, MATLAB, C, C++
- **Web Development:** TypeScript, HTML, CSS, JavaScript, SQL
- **Development Tools:** Anaconda, VS Code, IntelliJ, Code Composer Studio, Eclipse, Postman
- **Server Development Frameworks:** Express, Spring Boot, Django, Flask
- **Database Systems & ORMs:** MySQL, SQLite, TypeORM, Hibernate, Django ORM
- **AI/ML Tools & Frameworks:** LangChain, Stability AI, TensorFlow, PyTorch
- **OS/Other:** Linux, Windows, Git, OpenCV

LEADERSHIP EXPERIENCE

- **Treasurer** – Hindu Yuva, Iowa State University (May 2023 – May 2025)
- **Team Leader, Marketing & Sponsorship Manager** – F1 in Schools (2021 – 2022)

CERTIFICATIONS AND OTHER PROGRAMS

- 1-day Leadership Program – Zodiac HR Consultants (**2025**)
- MITx LaunchX's 'Becoming an Entrepreneur' Certification (**2022**)
- 2-week Shadow Program – Tej Control Systems (**2021**)
- HarvardX's CS50W: 'Web Programming with Python and JavaScript' Certification (**2020**)
- HarvardX's CS50X: 'Introduction to Computer Science' Certification (**2020**)