Shayaan Chaudhary

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Education

Brown University **Sep. 2022 – May 2026**

Sc.B in Computer Engineering, B.A in Applied Mathematics *GPA: 3.8*

Relevant Coursework

- **Hardware Architecture for Deep Learning** (taught by Michael Pellauer, Senior NVIDIA Research Scientist)
- Robotics Systems
- Design of Computing Systems (RISC-V)
- Digital Integrated Circuits (VLSI with lab projects)
- **Machine Learning**

Technical Skills

Software: Verilog, SystemVerilog, Java, Python, C/C++, TensorFlow, Git, HTML/CSS, Linux, Matlab, TCL
Hardware: Quartus, Vivado, Cadence, Synopsys, LTSpice, Fusion360, SolidWorks
Concepts: Verification, Robotics, Embedded Systems/Firmware, Oscilloscopes, RTL Design, VLSI, CAD

Experience

PROBE Lab **May 2024 – Present**

Undergraduate Research Assistant *Providence, RI*

- Engineered a **Python video processing algorithm** to detect nano-sized particle motion with sub-pixel accuracy.
- Leveraged high-performance computing cluster with **parallel processing** to efficiently analyze large-scale datasets, improving data processing time by **32%**.
- Interfaced lab instruments with Labview, including an **sCMOS camera**, quadrant photodetector, and **oscilloscope**.
- First-authored abstract at BMES National Conference 2024, co-authored **Optica publication**.

Projects

Neural Network Accelerator | *FPGA, SystemVerilog, Testbench* **January 2025**

- Implemented a **hardware-based neural network accelerator** using **SystemVerilog** for efficient inference.
- Developed a configurable 3-layer dense FCN (1 hidden layer) with a **FSM** and on-chip **BRAM** for weight storage.
- Utilized **Quartus** Signal Tap Logic Analyzer and automated **testbenches** with TCL, achieving **95.6%** accuracy.

FlappyJoyride | *FPGA, Verilog, Waveform Simulation* **November 2024**

- Built an **FPGA game** implementing **VGA-driven** video, game logic, and user-input object control.
- Implemented the game using **Verilog** on an Altera DE0-CV Cyclone V FPGA board.
- Debugged using **ModelSim Altera waveform simulation** tool, achieving smooth, high-resolution gameplay.

Helmet-Mounted Brake Light System | *C++, Oscilloscope, Communication Systems* **September 2024**

- Designed and developed a helmet-mounted LED brake light system using an **ESP32 microcontroller**.
- Incorporated an **MPU6050 accelerometer** sensor communicating via **I2C** protocol to detect real-time deceleration.

SBraille | *Raspberry Pi, PCB, CAD* **June 2022**

- Designed and built a refreshable Braille display, developing a custom **PCB** layout using Eagle.
- Developed Bash scripts and **Python** applications on a **Raspberry Pi microcontroller** to provide real-time translation from English text to Grade II Braille.
- Reduced manufacturing costs by **20%**, while maintaining market performance standards.

Leadership / Extracurricular

Brown Space Engineering **January 2024 – Present**

Avionics Subteam *Brown University*

- Developing a process to test a UHF dipole antenna at 435 MHz for resonance.
- Designing a digital burnwire circuit responsible for satellite arm deployment.

Brown Union of Global Students **November 2023 – December 2024**

Treasurer & Board Member *Brown University*

- Managed the funds of a 120+ member social organization.
- Worked with rest of 4-person board to lead members in philanthropy, networking, and social events.