Arnav Patil

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Education

University of Toronto Sept 2023 – Apr 2027
BASc. in Electrical and Computer Engineering with PEY Co-Op *Toronto, ON*

- **GPA: 3.60/4.00 with recognition on Dean's Honours List**
- **Minor in Engineering Business**
- **Extracurriculars:** UofT Engineering Society, IEEE UofT Student Branch, UofT Machine Intelligence Team

Technical Skills

Languages: **C/C++**, **Verilog**, **RISC-V Assembly**, **Python** (NumPy & pandas), MATLAB, Git, LaTeX
Hardware Courses: **Digital Systems**, **Computer Organization**, **Electronics**, Circuit Analysis
Software Courses: **Object-Oriented Programming**, Software Design, Computer Fundamentals

Experience

FPGA Research Intern Feb 2025 – Ongoing
Department of Electrical and Computer Engineering, University of Toronto *Toronto, ON*

- **Developing RTL and hardware-software co-design** for FPGA-controlled **computational imaging**.
- **Verification** of current and previous **ASIC schematics on Cadence Virtuoso** to improve future tapeouts.
- Writing a **custom Python API** for user control, enabling rapid prototyping in computer vision experiments.
- Researching at **Prof. Roman Genov's** Intelligent Sensory Microsystems Lab with the **CMOS Imaging Team**.

ML Compute Platform Developer Sept 2024 – Apr 2025
University of Toronto Machine Intelligence Student Team *Toronto, ON*

- Developing a compute platform for UTMIST to optimize ML jobs using **GPU accelerated cloud computing**.
- Working with a team of developers to **deploy the platform** and establish **monthly feature release cycles**.

Selected Projects

NIOS-V Sonar System on an FPGA | GitHub Repository

- Integrated ultrasonic sensor and servo motor into the FPGA-based NIOS-V soft processor via **GPIO ports**.
- Designed & implemented **BJT pull-up/pull-down networks** for safe 3.3V-to-5V signal interfacing on FPGA.
- Engineered **time-sensitive sensor polling using machine timer**, avoiding interrupts for timing precision.

Blackjack Implementation on an FPGA | Presentation Slides

- Developed a digital blackjack game using finite state machines (FSMs) on a DE1-SoC FPGA, handling **complex game states** such as dealing, betting, and scoring in real-time to **simulate card-counting experience**.
- Wrote a Python script to reformat memory initialization files, **fixing compatibility issues between provided legacy tools and modern IP cores**.

Personal Website | Portfolio + Course Notes Archive

- Customized a Hugo theme to **create a static portfolio website**, showcasing coursework and achievements.
- Deployed the site on GitHub Pages using a **continuous development pipeline** integrated into the repository through **GitHub Actions**, which automatically rebuilds and redeploys the site after each push.
- Integrated **Google Analytics 4** into the site to track insights and analyze which course pages are most popular.

Extracurricular Activities

Sustainability Director Apr 2024 – Ongoing
University of Toronto Engineering Society *Toronto, ON*

- **Oversaw 7+ projects**, from launching a **Sustainability Policy** to divesting clubs from fossil fuel sponsors.
- **Organized** a research team to conduct a study of the Engineering Society's and Faculty's historical and present carbon footprint and practices, and collecting student voices for sustainability in the curriculum.

First Year Engineering Class Representative Sept 2023 – Sept 2024
University of Toronto Engineering Society *Toronto, ON*

- Represented **70+ students** as a liaison between students, the Engineering Society, and the Faculty.
- Collaborating with EngSoc & Faculty members such as the Vice-President Academic, Vice-Dean First Year, and groups of professors to develop solutions enhancing **more than 1400 first-year students'** academic experience.