Diego Escalante

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EDUCATION

Bachelor of Applied Science in Electrical Engineering　　　　　　Minor in Artificial Intelligence
University of Toronto Class of 2026 +PEY Co-op

RELEVANT COURSES

Digital Systems, Programming in C/C++, Operating Systems, Probability, Engineering Economics, Computer Organization, Software Communication and Design, Signals and Systems.

SKILLS

Programming: Python, C/C++, Web Development (JavaScript, CSS, HTML), Bash, Git, Docker.
AI and Data Science: PyTorch, NLTK, Pandas, NumPy.
Hardware: Altium, Digital Design, STM32 Programming, Quartus Prime, Power Devices.

EXPERIENCE

Firefox Contributor　　　　　　　　　　　　　　　　　　　　Sep. 2024 – Present
University of Toronto Open Source Society (UTOSS)　　　　　　　　　　　　*Toronto, ON*

- Fixed three bugs in Firefox's codebase using C++ and MarkDown, with contributions accepted by Mozilla.
- Supported cross-platform development environment setup for team members.
- Help maintain a progress-tracking system using Google Sheets to monitor member contributions and project milestones, improving the record-keeping of the club
- Developing a custom Firefox extension for better music support.

Summer Research Fellow　　　　　　　　　　　　　　　　　　May. 2024 – Aug. 2024
University of Toronto　　　　　　　　　　　　　　　　　　　　　　　　*Toronto, ON*

- Optimized a power IGBT driver board with Altium, using newer components to increase efficiency by 2-3%
- Taught CAD design and microprocessor programming to 30+ engineering students.
- Revised and updated 20 lab manuals for four courses (With a total of over 500 students) through in person testing.

Web Developer　　　　　　　　　　　　　　　　　　　　　　　Jul. 2023 – Aug. 2023
Nimbus Digital Transformations　　　　　　　　　　　　　　　　　　*San Salvador, ELSL*

- Developed and integrated Create, Read, and Update operations for seamless data management in an Amazon Web Services (AWS) backend.
- Designed and implemented dynamic, responsive HTML/CSS components in Figma, ensuring smooth adaptability across devices and screen sizes.

PROJECTS

Haiku Generator (AI Model)　　　　　　　　　　　　　　　　　Sept. 2024 – Dec. 2024

- Developed a poetry generator using a GRU-based model in PyTorch, achieving near-human haiku quality (average score 4.3/5 vs. 4.5/5 for real poems).
- Collaborated with a team over a semester to train the model on 500,000+ lines of poetry from the Poetry Foundation, building a vocabulary of 109,976 distinct words.
- Process data using the CMU Pronouncing dictionary, NLTK, and the NumPy Python libraries.

Flow-Fields Simulation)　　　　　　　　　　　　　　　　　　　Sept. 2024 – Oct. 2024
Project Demo Link

- Designed and implemented a flowfields simulation in plain JavaScript, exploring dynamic patterns generated through Perlin noise for visual representation.
- Overcame challenges in handling screen resizing and particle trail wrapping by devising a custom solution to truncate point chains.
- Gained hands-on experience in simulating physics and solving mathematical problems.

unfairUndyne　　　　　　　　　　　　　　　　　　　　　　　Feb. 2024 – Apr. 2024
Project Link

- Engineered drivers to support 60fps animations and 8KHz audio on a 120MHz soft processor, optimizing performance.
- Coordinated with teammates using Git and best coding practices, maintaining a clean, modular codebase.
- Developed a detailed project plan for structuring game assets, logic, and workflow, delegating tasks and managing timelines for a polished final product.
- Authored thorough, consistent documentation for all major functions in the finalized code directory to ensure clarity and future maintainability.

SuperStar GIS   Jan. 2024 – Apr. 2024

- Built a Linux application using GTK and styled with CSS, achieving 30fps GUI animations.
- Processed 200M+ OpenStreetMap street segments in C++ with pathfinding optimizations for the traveling salesman problem.
- Integrated real-time weather updates using WeatherAPI, displaying visibility conditions for specific cities
- Create testing metrics for C++ code to analyze the most demanding functions, and guarantee memory safety.

Home Server   Jul. 2024 – Present

- Host a Debian-based system accessible remotely via Secure Shell (SSH) or Virtual Network Computing (VNC) for efficient system management.
- Develop a responsive personal website with the React framework, Javascript, HTML, and CSS. Deployed the website with Cloudflare and Nginx.
- Optimized workflow by offloading Python scripts, including PyTorch models and web scrapers, to the server, achieving 2-3x faster execution.
- Refurbished older hardware to create a high-performance, cost-effective home lab, with electricity costs of just $2.18/month.