Tanuj Dargan

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Education & Awards

University of Victoria - International Undergraduate Scholarship Victoria, BC

Computer Science (B.S.) *April. 2027*

Relevant Coursework: Calculus 1-4, Discrete Mathematics, Linear Algebra, Data Structures & Algorithms

Experience

Pear Care Jul. 2025 – Present

Lead AI Developer *Remote*

- Developed a suite of autonomous medical-AI agents using (MoE), task-introspective-reasoning agents, and adaptive task routing.
- Optimized LLMs for task-specific and memory-efficient deployment by employing quantization and LoRA/PEFT/SFT approaches.
- Designed high-performance inference pipelines with bespoke benchmarks, ethical protections, and graph-driven work scheduling.
- Built RAG-scalable, multi-tenant AWS-cloud architectures with data security protocols and mobile access for production AI agents.

Major League Hacking (MLH) SWE Fellowship - Apache Airflow May. 2025 – Aug 2025

Software Engineering Fellow *Remote*

- Worked in a team of 3 alongside Royal Bank of Canada to enable direct IDE debugging (VSCode, PyCharm) for Airflow by exposing Docker image ports, streamlining developer workflows and reducing troubleshooting time by up to 50%.
- Created a feature to surface missed DAG runs scheduled in the past, resolving a long-standing logic bug and improving failure detection coverage by upwards of 30% for time-critical workflows.

DEIA (Database & Data Mining) May 2025. – Present

Undergraduate Researcher - Prof. Sean Chester *Remote*

- Architected and optimized cuVS-based search deployments to maintain 90–95% recall, sub 250 ms query latency, and 1–4M QPS at billion vector scale, scaling efficiently across 8+ GPUs and sustaining throughput over 2TB of indexed data.
- Automated stress-testing and performance analysis of CAGRA and IVF indices on Kubernetes-managed GPU clusters, achieving 4.3× throughput scaling and exposing bottlenecks in memory and interconnect bandwidth.

SOLIDS (Software for Large-Scale, Distributed, Intelligent, and Secure Systems) May. 2025 – Present

Undergraduate AI Researcher - Dr. Navneet Popli *Remote*

- Training a multimodal neural network model using Ocean Networks Canada sensor data and satellite imagery to enable predictive analysis of coastal erosion drivers and continuous shoreline monitoring.
- In collaboration with the National Research Council Canada, tested model predictions against real-world sensor data and established mathematical correlations between environmental variables and erosion patterns to validate model performance.

UVic Centre for Aerospace Research X UVic Satellite Design Apr. 2025 – Present

Software Developer & Undergraduate Researcher *Victoria, BC*

- Implemented C/Java parsing and encoding functions to interface existing OBC software with YAMCS, enabling seamless integration during the transition to the new mission control system for the MarmotSat 1U CubeSat.
- Collaborated with cross-functional teammates to extend the HIL rig using Raspberry Pi 4, self-hosted GitHub Actions, and SWD flashing to validate greater than 80 checksum rules per commit and ensure reliable simulated sensor data.
- Developed a YAML-driven CI workflow that cut manual testing from 30 min to $\sim$ 4 min automated, enabling nightly regression and rapid failures, and improving team productivity and project turnaround.

Projects

Optimate: Hack the North 2025 Winner (Y Combinator Unicorn Prize & Federato Best RiskOps Solution) Sept 2025

- Built Optimate, an AI-powered underwriting dashboard using Next.js, shadcn, Cohere LLMs with RL, and AWS DynamoDB.
- Delivered explainable AI insights, interactive heatmaps, and real-time portfolio tracking to streamline underwriting workflows cutting review time by up to 50%, reducing errors by 20%, and enabling more accurate decisions through an AI research agent.

Drop: Open Source AirDrop Alternative | *Rust, Next.js, WebRTC, NFC/BLE* Present

- Building a cross-platform file sharing tool using Rust and Next.js, with peer-to-peer WebRTC transfers, secure session management, and NFC/BLE-based device discoveryno app install or shared Wi-Fi needed.

AIMO Progress Prize 2 Competitor: Silver Medal | *Finishing score: 27* Nov. 2024 – Mar. 2025

- Engineered and optimized multi-stage LLM pipelines leveraging advanced prompt engineering, modular reasoning strategies, and hyper-parameter tuningto raise math-word-problem accuracy to 54%, and finishing in the top 10% of 2200 teams.

Wedding Studio - Buildspace s5 | *Next.js, Python, Torch* Jun. 2024 - Aug. 2024

- Built and launched an AI-powered Wedding Studio MVP in 6 weeks (Y Combinator/a16z-backed), enabling couples to generate personalized venue mock-ups from real photos using a diffusion model, and rapidly connecting them with vendors through live demos.

Technical Skills

Languages: Python, Java, C/C++, JavaScript & TypeScript, Ruby, Go, R, Bash, Rust, Slurm, SQL, LaTeX
Frameworks: Node.js, Next.js, React, Three.js, Vite, Django, Tailwind CSS, PyTorch, Tensorflow, OpenCV Pandas, Flask, Streamlit
Developer Tools: GitHub, Git, Docker, Figma, Blender, Make, Vercel, DBMS, AWS (Lambda, SageMaker, EC2, S3, Bedrock)
Certifications: CS50, Three.js Journey, Meta Frontend Dev Course, IBM DevOps & SWE