Anant Gupta

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Education

University of Alberta Edmonton, AB

Bachelor of Science, Specialization in Computing Science *September 2023 – April 2027*

- **Awards:** Dean's Honour Roll (2023–24, 2025–26); International Admission Scholarship and Regional Excellence Scholarship (2023); Undergraduate Scholarship (2024)
- **Relevant Coursework:** Practical Programming Methodology (C), Algorithms, Computer Architecture, Software Engineering, Software Process and Product Management, File and Database Management, Machine Learning I & II

Work Experience

Research Assistant May 2026 – Present

University of Alberta, Computing Science – Supervisor: Prof. Irene Cheng *Edmonton, AB*

- Built and debugged a PyTorch Lightning training pipeline for agricultural field segmentation, fine-tuning DINOv3-pretrained ConvNeXt encoders (up to 196M parameters) in a UNet architecture and achieving 0.896 mIoU on a held-out 300-image dataset.
- Diagnosed and fixed a non-reproducible evaluation bug caused by unintended data augmentation at inference time, restoring reliable model comparison across experiment runs.
- Ran a 20-trial Optuna hyperparameter search over learning rates and weight decay, improving validation mIoU by 5+ points over hand-tuned defaults.
- Benchmarked 4 CNN and vision-transformer encoder architectures against a ResNet50 baseline and hand-annotated 2,500+ image patches to expand the training dataset.

Machine Learning Intern May 2025 – August 2025

Instant Systems Inc. *Noida, India*

- Automated preprocessing and YOLO-format annotation of a 1,200-image dataset using Python and NumPy, applying PyTorch-based data augmentation that improved model validation accuracy by 20%.
- Built a Python dataset pipeline to split 1,200 images into training, validation, and test sets, eliminating manual file management and reducing setup time for new experiments.
- Containerized the computer vision training workflow with Docker, eliminating environment-specific dependency failures across developer workstations and production servers.

Projects

EDSS Navigator | *React Native, TypeScript, FastAPI, Firebase, GitHub Actions, AWS Lightsail* January 2026 – Present

- Built a cross-platform mobile app for the Edmonton Down Syndrome Society in a team of 6, working in sprints from 18 user stories across 5 epics tracked on a GitHub Kanban board.
- Set up continuous integration on a self-hosted GitHub Actions runner after the team exhausted free build minutes; tests run on every pull request and PRs to main require all tests to pass.
- Wrote 65+ of the team's 142 automated tests (pytest for the FastAPI backend, Jest for the React Native frontend), writing tests alongside each feature I built.
- Developed an admin content management system with secure login, resource CRUD, and CSV export of usage analytics; deployed the backend on AWS Lightsail for App Store and Google Play release.

pLUCK — Event Lottery Android App | *Kotlin, Jetpack Compose, Firebase, Git* November 2025

- Built 4 screens (authentication, event discovery, waitlist, and organizer management) in a team of 6, delivering a lottery-based event registration system.
- Authored 50 automated UI tests across 10 test files using Jetpack Compose testing APIs, validating core user flows and catching regressions across all screens.
- Implemented lottery enrollment logic, including automatic cancellation of non-responsive users and re-selection, with input validation and error handling across all flows.

Ray Tracer | *C, Linear Algebra, Computer Graphics* December 2024

- Implemented a ray tracing engine in C from scratch with no external libraries, rendering a 3-sphere scene at 8×5 pixels with Phong shading, ray-sphere intersection, shadow casting, and anti-aliasing.

Technical Skills

Languages: C, Python, TypeScript, Kotlin, SQL, HTML/CSS
Testing & CI: pytest, Jest, React Native Testing Library, Jetpack Compose testing, GitHub Actions, Git
Frameworks & Libraries: React Native, FastAPI, Node.js, Jetpack Compose, PyTorch, NumPy
Tools & Platforms: Docker, Linux, Firebase, AWS Lightsail