

# Ethan Ngai

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## EDUCATION

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### Cornell University

May 2028

*Bachelor of Arts in Computer Science and Mathematics*

*Ithaca, NY*

- **GPA:** 4.0
- **Relevant Coursework:** Data Structures & Algorithms, Functional Programming, Discrete Math, Linear Algebra, Multivariable Calculus

## WORK EXPERIENCE

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### Cornell Bowers College of Computing and Information Science

January 2026 – Present

*Teaching Assistant*

*Ithaca, NY*

- Leads discussion section for CS2110 (Data Structures & Algorithms) with over 20 students
- Grades programming assignments and exams, hosts office hours
- Writes autograder software and test cases for course management system in Java

### Cornell XR Project Team

November 2025 – Present

*Software Team Member*

*Ithaca, NY*

- Developing persistent memory framework for smart glasses with conversation transcription and facial recognition
- Creating **RAG**-based semantic recall with **pgvector**, FastAPI, SQLAlchemy, and OpenAI API

### VCU College of Engineering Research Lab

July 2024 – May 2025

*Machine Learning Research Assistant*

*Richmond, VA*

- Researched **machine learning** applications for wireless communications at Virginia Commonwealth University
- Built software in **Python** utilizing Meta Quest 3 depth sensors to train machine learning model, created workflow to translate **WiFi-Sensing** channel state information to depth images
- Created AI model with **PyTorch** to denoise simulated signal, improved accuracy by nearly 40%

## PROJECTS

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### Sharpnd

- Building adaptive studying and tutoring platform using **TanStack Start**, **React**, **Drizzle ORM**, **PostgreSQL**
- Created a **CI/CD** pipeline for edge deployment to **Cloudflare Workers**, Neon, and R2 storage
- Designed adaptive question algorithm using semantic vector similarity and tag-based fuzzy search
- Implemented user authentication and email with Better Auth and Google **OAuth** API

### SafeStep

- Created full-stack crowdsourced accessible walking/driving mapping software for 2026 Hack@Brown
- Built backend RESTful API and CRUD actions with **Spring Boot** and **PostgreSQL/PostGIS**
- Implemented A\* pathfinding algorithm and adjusted edge weights based on reported hazards along walking path
- Created **React** frontend, using Leaflet and OpenStreetMap for mapping display, Nominatim for name-location search
- Used pothole segmentation detection model and Google Gemini API to evaluate danger levels of user-submitted photos

### Home Archery

- Built mixed reality archery game using **Meta XR SDK**, importing 3D room scans for environment-aware collisions
- Designed player scoring logic, physics interactions, and UI/UX using **C#** and **Unity**

## SKILLS

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- **Programming Languages:** Java, Python, C#, OCaml, C/C++, JavaScript/TypeScript, HTML, CSS
- **Frameworks:** Spring Boot, React, Node.js, TanStack Start, Next.js, FastAPI, Flask, SQLAlchemy, PyTorch
- **Tools:** PostgreSQL, Docker, Cloudflare, Supabase, Convex, Vercel, Vite, Claude Code
- **Software:** Git, Linux, Postman, Unity, Photoshop, Illustrator, Microsoft Office 365, LaTeX