

# Ethan Xing

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## EDUCATION

University of Waterloo, Mechatronics Engineering - Bachelor of Applied Science

GPA: 3.95

*Relevant Coursework: Data Structures & Algorithms, Circuits, Digital Computation, Linear Algebra, Calculus I & II*

## SKILLS

**Programming Languages:** Python, C++, JavaScript, TypeScript, SQL, HTML/CSS, Bash

**Frameworks & Libraries:** React, Next.js, Node.js, Tailwind CSS, ROS2, TensorFlow, NumPy, Pandas

**Tools & Platforms:** Git, GitHub, Docker, Supabase, Google Cloud Platform, Linux, VS Code

**Hardware:** SolidWorks, OnShape, AutoCAD, Microcontrollers, Breadboarding, PCB Design

## PROJECTS

Scribe | Python, Tensorflow, Keras, Gemini API



- Built and deployed an **ML-powered full-stack accessibility tool** to transcribe handwriting for those with Parkinson's
- Designed a **data processing and inference pipeline** on 7,000+ handwriting samples with preprocessing and batching
- Achieved **92% accuracy** through debugging, batching, pipeline optimization, and iterative performance tuning
- Leveraged **Gemini API**, to **improve accuracy on edge cases** and **optimize performance** on larger text excerpts

Melodica | Tone.js, Web Audio API, TypeScript, Supabase, Google Cloud Platform



- Built a browser-based **digital audio workstation (DAW)** with an interactive piano-roll interface for music production
- Implemented a **real-time audio scheduling system** using **Tone.js** and the **Web Audio API** to ensure precise playback
- Optimized frontend performance** by implementing **viewport-based loading** to reduce DOM overhead in the editor
- Designed a **scalable JSON-based data model** to enable efficient save/load, state management, and audio export to MP3

AXIOM | MapboxGL, Next.js, TypeScript, Gemini API, Supabase



- Built a **full-stack AI platform** that models grading schemes across Canadian high schools to **normalize** GPA comparisons
- Developed an **interactive map-based interface** with MapboxGL enabling users to explore and compare **2,000+** schools
- Deployed a **multi-agent backend system** to retrieve data, analyze rankings, and answer user queries with grounded data
- Built **web-scraping** and processing pipeline to **extract structured school data** from several sources for efficient querying

NewDen | Python, React, Javascript, spaCy, Gemini API



- Built a **full-stack NLP system** for scam-detection, helping identify over **3,000 fraudulent housing listings** in Ontario
- Extracted key structured entities** and used them to **improve** scam detection **beyond keyword-based methods**
- Custom-trained an NER model** (~1,000 samples per entity) to extract structured fields such as address and city name
- Leveraged GeminiAPI to **aid processing speeds** and enable comparisons of real-world housing data from any region

## EXPERIENCE

Robotics Software Researcher

Sep 2025 – Present

University of Waterloo - Robohub | Python, Kortex API, 3D Printing, ROS2, MeshCat

Waterloo, ON

- Developing control software systems** using **Python & ROS2** to control a 6-DOF robotic arm with millimeter precision
- Used **3D MeshCat visualizations** to **optimize** and **plan toolpaths** efficiently, **reducing operating costs by 32%**
- Iterated **kinematics behaviors** in a R&D environment with visualizations and **debugging** in real-world conditions

Executive Director

Sep 2023 – Jun 2024

University of Waterloo - Canadian Youth STEM Conference

Waterloo, ON

- Led logistics for a **national youth STEM conference (300+ attendees)** hosted at the **University of Waterloo**
- Creative Director** for Innovation Challenge, designing prompt, rules, judging criteria, and team-based challenge structure
- Managed **speaker outreach, scheduling, and on-site coordination**, ensuring smooth real-time program execution
- Led **event-day operations**, including setup, sign-in, crowd flow, and speaker mic running in a fast-paced environment

Tutor & Secretary

Sep 2021 – Aug 2025

KUMON Canada - Laurelwood Commons

Waterloo, ON

- Supported academic progress for **400+ students** in math and English by working across all weekly shifts and class levels
- Accelerated early-learner literacy by **completing 2 reading levels (400+ pages) in 2 months**, exceeding typical pacing
- Managed **high-volume operations (3–10 parent inquiries per session)**, overseeing records, inventory, and payments
- Independently resolved **real-time scheduling and operational issues**, frequently covering for understaffed shifts