

# Haokai Xuan

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 [LinkedIn](#) |  [GitHub](#)

Location: Canada + Wherever I'm needed.

## OBJECTIVE

Learner, problem solver, leader, and maker of reality. Aiming to be a force of net good to the world by broadening my knowledge and contributing to areas of technology such as AI/ML, data science, software engineering, web dev, cyber security, robotics, and game dev.









## EXPERIENCE

- **Brunswick St. Baptist Church** Jul. 2022 - Aug. 2024  
*Volunteer* Fredericton, Canada
  - Provided piano accompaniment for congregation every other week.
  - Ensured Sunday school cleanliness for 100% of attended sessions.
- **Chinese Cultural Association of New Brunswick** Sept. 2021 - Jun. 2022  
*Kung Fu Coach* Fredericton, Canada
  - Trained a team of 10+ students in rudiments Kung Fu stances and sequences.
  - Invited to appear on local lunar new year gala.

## EDUCATION

- **University of Waterloo** Sept. '24 - Apr. '29  
*Computer Science* Waterloo, Canada
  - GPA: 3.92/4.00
- **Fredericton High School** Jun. 2024  
*Secondary Education* Fredericton, Canada
  - Valedictorian 

## PROJECTS

- **Elementle: Wordle-inspired game for element guessing.**  Feb. 2024 - Present  
*Tools: HTML, CSS, JS, Python, Flask* 
  - Developed flask back-end to generate mystery element seeded on current date.
  - Created JSON storage for all recent mystery elements thus delaying element repetition.
  - Drove a 175% increase in average player count by implementing a python twitter bot to post previous day's guess distribution and mystery element.
- **AI Impossible Tic Tac Toe: Your preposterous line of three.**  Jan. 2025  
*Tools: Python, Pygame* 
  - Inspired by Harvard's CS 50 AI course.
  - Implemented minimax algorithm for AI to always win or tie.
  - Optimized algorithm to find quickest win and prune unnecessary computations with alpha-beta pruning algorithm.
  - Integrated visuals using pygame and developed reusable buttons using OOP.
- **Theorem Solver: Calculator for computing mathematical theorems.**  Jan. 2025  
*Tools: HTML, CSS, JS, Python, Flask, LaTeX* 
  - Wrote all algorithms to compute the results of mathematical theorems with given input from user.
  - Implemented POST method and handling of input.
- **Flappy Arms: Flappy Bird remix with webcam. Control bird by doing push ups.**  Oct. 2024 - Jan. 2025  
*Tools: Python, Pygame, OpenCV* 
  - Implemented OOP for bird and pipes.
  - Developed window resizing for different webcams and mapping of face position to bird height.
  - Implemented exponential smoothing on bird height for improved game experience.
  - Exported .exe for distribution, refer to above link to read more.

## SKILLS

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- **Programming Languages:** Python, C++, C, JS, Java, Racket
- **Web Technologies:** Django, Flask, CSS, HTML
- **Database Systems:** SQLite, JSON
- **Data Science & Machine Learning:** OpenCV
- **Cloud Technologies:** PythonAnywhere
- **DevOps & Version Control:** Git
- **Other Tools & Technologies:** Linux, LaTeX, MuseScore

## HONORS AND AWARDS

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- **Valedictorian** Jun. 2024  
*Fredericton High School* [🌐]
  - Wrote and delivered speech to 400+ graduates.
  - Selected by committee of principal and English teachers, and 25+ student nominations.
- **Senior Award of Excellence for Piano** May 2024  
*Fredericton Music Festival* [🌐]
  - Adjudicator's choice in piano for music festival.
  - Performed RCM level 10 and RCM ARCT pieces.
- **CAP Exam** May 2024  
*Canadian Association of Physics at the University of British Columbia*
  - Provincial 3rd place.
- **RCM Music Exam** Dec. 2023  
*Royal Conservatory of Music*
  - First class honors in level 8 for piano.
- **UNB High School Programming Competition** Apr. 2022  
*University of New Brunswick* [🌐]
  - Provincial 2nd place.

## ACTIVITIES AND LEADERSHIP

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- **Air Cadets (Flight Sergeant)** Sept. 2019 - May 2024  
*Royal Canadian Air Cadets*
  - Delivered lectures to 100+ cadets in leadership and aerodynamics. Later awarded instructor of the year in 2024.
  - Led 10+ cadets to restart mini-band as 2nd-in-command after COVID.
- **Music Ensembles (Concert Band, Jazz Ensemble, Glee Piano Comp., Pit Band)** Sept. 2020 - May 2024  
*Fredericton High School*
  - Accompanied a choir at the 2023 Sherbrooke Music Festival, mastering six pieces in under four weeks and helping secure 1st place.
  - Organized and digitized concert band music, contributing to a 1st place win at the 2023 local music festival
  - Invited by Theatre New Brunswick as one of four students to learn a musical's keyboard repertoire in a week; performed in two sold-out shows.
  - Played smooth jazz at the Teacher Association's 2024 retirement gathering.
  - Awards: Musical Leadership (2023), Director's Award (2024).

## ADDITIONAL INFORMATION

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**Languages:** English (Fluent), Chinese (Fluent), French (Conversational)

**Interests:** Self-improvement, Fitness, Music