

Haokai Xuan

+1-506-897-2580 | [✉ haokai.xuan2006@gmail.com](mailto:haokai.xuan2006@gmail.com) | [🏠 haokai-xuan.com](https://haokai-xuan.com)

[🌐 LinkedIn](#) | [🐙 GitHub](#)

📍 Waterloo, Canada + Wherever I'm needed.

EDUCATION

• University of Waterloo

Computer Science

◦ GPA: 3.92/4.00

◦ Autonomy Member [@UWARG](#).

Sept. '24 - Apr. '29

Waterloo, Canada

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.

• The Riffler: Guitar-Playing Robot [🌐](#)

Feb. 2025

Tools: Python, Arduino, PyGuitarPro, PySerial

[🐙](#)

- Pitched final product for 400+ hackers as top 5 finalist.
- Built automated guitar tab parser and developed live simulation for sending commands from parsed music to Arduino using PySerial.
- Contributed to hardware implementation.

• 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.

HONORS AND AWARDS

- **Valedictorian**

Jun. 2024

Fredericton High School



- Wrote and delivered speech for 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

- **Waterloo Aerial Robotics Group**

Mar. 2025 - Present

University of Waterloo Design Team

- Autonomy Member

- **Music Ensembles (Concert Band, Jazz Ensemble, Glee Piano Comp., Pit Band)**

Sept. 2020 - May 2024

Fredericton High School

- Instruments: Piano, Clarinet.
- Awards: Musical Leadership (2023), Director's Award (2024).

- **Air Cadets**

Sept. 2019 - May 2024

Royal Canadian Air Cadets

- Flight Sergeant, Instructor, Mini-band 2IC
- Awards: Instructor of the year (2024).

SKILLS

- **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

ADDITIONAL INFORMATION

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

Interests: Self-improvement, Fitness, Music