

# Haokai Xuan

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[🌐 LinkedIn](#) | [🐙 GitHub](#)

📍 Waterloo, Canada + Wherever I'm needed.

## EDUCATION

### • University of Waterloo

Bachelor of Computer Science, Honours Co-op, GPA: 3.64/4.00

Sept. '24 - Apr. '29

Waterloo, Canada

## EXPERIENCE

### • Waterloo Aerial Robotics Group

Autonomy Member

Mar. 2025 - Present

Waterloo, Canada

- Optimized distribution of pathing for task done by multiple drones.
- Calibrated IR camera hotspot detection to ensure absence of all false positives and negatives.

## PROJECTS

### • Elementle: Wordle-inspired game for element guessing. [🌐](#)

Tools: HTML, CSS, JS, Python, Flask

Feb. 2024 - Jan. 2025

[🔗](#)

- 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. [🌐](#)

Tools: Python, Arduino, PyGuitarPro, PySerial

Feb. 2025

[🔗](#)

- 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. [🌐](#)

Tools: Python, Pygame

Jan. 2025

[🔗](#)

- 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.

### • Flappy Arms: Flappy Bird remix with webcam. Control bird by doing push ups. [🌐](#)

Tools: Python, Pygame, OpenCV




Oct. 2024 - Jan. 2025

[🔗](#)

- 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

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- **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

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- **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).

## CERTIFICATIONS

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- **Python Mastery** Aug. 2024

## SKILLS

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- **Languages:** Python, C++, C, JS, Java, Racket, SQL, CSS, HTML
- **Frameworks:** Django, Flask, React, OpenCV, Pandas
- **Tools:** Git, Linux Bash, Flutter, Arduino

## ADDITIONAL INFORMATION

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**Languages:** English (Fluent), Chinese (Fluent), French (Conversational)  
**Interests:** Self-improvement, Fitness, Music