Yue Zhang

Ph.D. Candidate in Computer Science, University of Ottawa
+1 343-597-2535 yzha1030@uottawa.ca / yuezhang1437@gmail.com
https://sdawzy.github.io/

Profile

Ph.D. candidate specializing in **learning theory for languages**, with research spanning **reinforcement learning, GFlowNets, AI robustness, computational linguistics, and CS pedagogy**. Experienced in designing AI algorithms, building large-scale simulation environments, and creating educational tools adopted by dozens of institutions. Skilled in **full-stack development, computational modeling, and cross-disciplinary collaboration**.

Education

University of Ottawa, ON, Canada — Sept 2024 – Present
Ph.D. Candidate in Computer Science (GPA: 9.8/10.0)
Co-supervised by Prof. Yongyi Mao & Prof. Tommaso Cesari
Thesis: *Learning Theory for Languages*

Swarthmore College, PA, USA — Sept 2021 – May 2024
B.A. in Mathematics (Minors: Computer Science, Asian Studies), GPA: 3.97/4.00

Research Interests

Language identification & generation in the limit; Generalization analysis in Reinforcement Learning & GFlowNets; CS education & pedagogy

Research Experience

Research Assistant — University of Ottawa, ON, Canada — *Feb 2025 – Present*
Collaborators: Canadian Department of National Defence

- Collaborating with the Department of National Defence to assess the missile defense system.
- Researching robustness of AI algorithms for configuring and deploying ground-based interceptors.
- Developing a Missile Threat Simulator within SMADE to evaluate AI-based defense strategies.

Researcher — Swarthmore College, PA, USA — *May 2023 – Aug 2023*
Collaborators: Prof. Kevin Webb & Prof. Tia Newhall

- Built interactive pedagogical tools for the online textbook *Dive Into Systems*, using JavaScript & Runestone Academy.
- Created visualizations and infinite question banks; adopted by **40+ colleges**.
- Project Link

Research Assistant — University of Ottawa, ON, Canada — *May 2022 – Aug 2022*
Collaborators: Prof. Yongyi Mao & Prof. Gonzalo G. Alvarez

- Developed optical parsing algorithms to extract residential addresses from Nunavut maps for pandemic control.

- Applied clustering algorithms and visualized optimal results for regional subdivision.

Research Assistant — Swarthmore College, PA, USA *Sept 2022 – May 2024*
Collaborator: Prof. John Bundschuh

- Applied computational linguistics to analyze verb structures in the Sanskrit *Golden Light Sutra*.
- Compared multiple text versions and Japanese translations to identify translation patterns in Buddhist texts.

Projects & Development Work

Full-stack Developer — Gongzhu Card Game AI, ON, Canada Jan 2025 – May 2025

- Developed front-end UI in React & React Native; backend with Flask & Supabase.
- Tested AI agents using reinforcement learning and developed performance metrics.
- Project Link

Software Developer — Japhug Machine Translation, PA, USA Jan 2023 – May 2023

- Built rule-based machine translation for underresourced language, Japhug, using Apertium.
- Created orthographic converter between IPA and Tibetan Script.
- Project Link

Tutor — Math Mentorship Program, University of Ottawa Feb 2025 – Present

- Mentoring undergraduates in mathematics, CS, and deep learning for cancer surgery planning.

Front-end Developer — Swarthmore Computer Science Society, PA, USA Feb 2023 – Feb 2024

- Designed & implemented React+TypeScript admin system for student-run Crumb Café.

Developer — Independent Minecraft Server Project, Chengdu, China Mar 2021 – Oct 2021

- Programmed AI-driven NPCs, quests, and challenges using ECMAScript & Java.
- Designed narrative, special effects, and backend; server attracted ∼500 players post-launch.

Teaching & Mentoring

Teaching Assistant — University of Ottawa Sept 2024 – Apr 2025

- Led labs for **GNG1106(Engineering Computation)** and **ITI1121(Introduction to Computing II)**; provided guidance via office hours and detailed grading feedback.

Teaching Assistant — Swarthmore College Jan 2023 – May 2024

- Graded and provided feedback for **MATH035(Multivariable Calculus with Theories)** and **MATH101(Analysis on Manifold and Intro to Measure Theory)**.

Awards & Scholarships

Graduate Merit Scholarship — University of Ottawa (2024–2025)
Hannah A. Leedom Fellowship — Swarthmore College (2024–2025)

Membership

Member of Phi Beta Kappa Society - Since May 2024

Skills

Programming: Python, TypeScript, C, C++, Java, OCaml
AI/ML: PyTorch, Reinforcement Learning, Statistical ML, Deep Learning
Web & Mobile: React, React Native, Node.js, Expo, Supabase, Prisma
Tools: Git, Docker, Figma
Databases/Cloud: SQL, Supabase
Languages: English (fluent), Mandarin (fluent), French (proficient), Japanese (proficient), Sanskrit (reading)

Presentations

"Interactive Exercises For Dive Into Systems" — Sigma Xi Poster Session (Sept 2023)
"A Tibetan Script-based Orthographic Conversion Tool for Japhug" — Computational Linguistics Presentation (May 2023)

Leadership & Activities

Organizer, Philadelphia Shogi Club — hosted weekly board game sessions
Long-distance cycling enthusiast; active Go and Shogi player