

# Richard Shi

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## EDUCATION

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### University of Toronto

Toronto, ON

*MSc in Applied Computing, AI Concentration*

*Sep 2025–Dec 2026 (expected)*

- Relevant Coursework: Deep Learning: Theory & Data Science, Causal Machine Learning, Visual and Mobile Computing Systems

### University of Toronto

Toronto, ON

*HBSc with High Distinction, Computer Science Specialist and Mathematics Minor*

*Sep 2021–Apr 2025*

- cGPA: 3.98/4.0
- Recognized as a President's Scholar of Excellence which is awarded to approximately 150 highly qualified students
- Relevant Coursework: Intro to Computer Vision, Natural Language Processing, Neural Networks & Deep Learning

## EXPERIENCE

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### Undergraduate Machine Learning Research Assistant

Toronto, ON

*SysNet Research Group, University of Toronto*

*May 2024–Sep 2024*

- Researched methods to improve performance and privacy in federated learning with a focus on reducing privacy leakage, mitigating straggler clients, and accelerating both per-epoch and end-to-end training times
- Implemented client-side invariant neuron pruning and network-aware pruning with secure aggregation to speed up training for compute- and network-bottlenecked stragglers while preserving client data privacy
- Achieved up to 30% speedup in per-epoch and end-to-end training time with no more than a 2.6% drop in accuracy
- Conducted preliminary experiments to assess the effects of stragglers on training times and qualitatively evaluated our pruning technique, enabling further scalability tests
- Presented to an audience of 50+ professors and researchers and earned 2<sup>nd</sup> place among 20+ research posters at the University of Toronto's Department of Computer Science Summer Research Poster Showcase 2024

### Software Developer

Toronto, ON

*Students Developing Software Team, University of Toronto*

*Jan 2023–Sep 2023*

- Contributed to PythonTA, an open-source static code analysis tool used by 2000+ students at the University of Toronto in first-year computer science courses
- Created new linters and custom renderers to highlight coding violations and improve clarity of errors, enhancing usability for students
- Designed an API for students to generate control flow graphs, supporting deeper exploration and visualization of code execution
- Maintained codebase through updating documentation, bug fixes, and improving readability for error messages
- Delivered weekly presentations to share task progress and technical insights with peers across different projects

## OTHER EXPERIENCE

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### Mathematics Teaching Assistant

Toronto, ON

*Department of Mathematics, University of Toronto*

*Sep 2023–Present*

- Supported overall 200+ students through office hours and monitoring online discussion forums across both single and multivariable theoretical calculus courses
- Led weekly tutorial sessions for a combined 100 students by facilitating group work and discussions
- Efficiently graded 1000+ submissions per assessment and gave detailed feedback to improve student performance

### Computer Science Teaching Assistant

Toronto, ON

*Department of Computer Science, University of Toronto*

*Sep 2025–Present*

- Assisted instructors in assessment preparation by giving feedback to improve the student learning experience
- Led weekly labs for a total of 50 students by monitoring the completion of weekly quizzes
- Supported students during office hours by helping with coding in Python or explaining coding concepts

## AWARDS

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University of Toronto Excellence Award

2024