

Chen Ying

Assistant Professor, Teaching Stream

Edward S. Rogers Sr. Department of Electrical and Computer Engineering
University of Toronto

10 King's College Road, Toronto, Ontario M5S 3G4, Canada

Office: (416) 978-2904 • cying@ece.utoronto.ca • eecg.utoronto.ca/~cying

TEACHING & RESEARCH INTERESTS

Focus: Connecting academic learning with professional engineering practice

- Software engineering education in large-scale graduate courses
- Authentic, project-based learning and the development of technical judgment
- The role of AI in learning, assessment, and software engineering education

TEACHING EXPERIENCE

University of Toronto

Edward S. Rogers Sr. Department of Electrical and Computer Engineering

ECE1724: Advanced Web Development: React Ecosystem and Modern Frameworks

Winter 2025 (113 students) • Winter 2026 (108 students) • Fall 2026

- Designed a graduate curriculum in modern full-stack web development spanning frontend and backend development, relational data, application integration, and cloud-based storage using TypeScript, React, and Next.js.
- Structured progressive assignments and a collaborative project around application architecture, system integration, technical decision-making, evaluation, and professional development practices.

ECE1779: Introduction to Cloud Computing

Fall 2025 (111 students) • Winter 2026 (107 students) • Fall 2026

- Developed a hands-on graduate course covering cloud service models, containerization with Docker, orchestration with Kubernetes, serverless architectures, edge deployment, and distributed application monitoring.
- Combined progressive technical assignments with a collaborative project in which students designed, deployed, evaluated, and communicated cloud-based systems while reasoning about technical choices and trade-offs.

ECE1778: Creative Applications for Mobile Devices

Fall 2025 (95 students) • Winter 2027

- Redesigned the course as an ECE-focused introduction to modern cross-platform mobile development using React Native, Expo, and TypeScript, spanning interface development, navigation, state and data management, backend integration, authentication, notifications, and deployment.

- Structured connected assignments around a progressively evolving mobile application, followed by a collaborative project in which students independently defined, integrated, evaluated, and communicated a complete mobile application and its technical and design decisions.

EDUCATIONAL INNOVATION & GRANTS

Bridging the Classroom and Professional Practice: An AI Learning Companion for Large-Scale Graduate Courses

Jan 2026 – present

Graduate Education Innovation Fund (GEIF), University of Toronto

Principal Investigator

An AI-powered learning tool embedded in course websites that helps students explore and understand professionally developed software systems through retrieval and annotation of curated codebases.

- Leading the design and development of a privacy-preserving, locally hosted system for use in large-scale graduate courses.
- Integrating curated open-source codebases and course materials to support guided exploration of system architecture, design patterns, and engineering practices.
- Exploring how AI can support students in engaging with complex software systems through guided inquiry rather than solution generation.

PROFESSIONAL EXPERIENCE

University of Toronto

Jan 2025 – present

Assistant Professor, Teaching Stream, Edward S. Rogers Sr. Department of Electrical and Computer Engineering

Toronto, Ontario, Canada

- Design and teach large-scale, project-based graduate courses in software engineering, connecting foundational concepts with contemporary engineering practice.
- Design project and assessment structures for large courses that support authentic engineering work, technical judgment, and consistent evaluation.
- Develop educational approaches for thoughtfully integrating AI into learning, including a GEIF-funded AI Learning Companion for large-scale graduate courses.

Huawei Canada

May 2023 – Dec 2024

Researcher, Computer Network and Protocol Team

Markham, Ontario, Canada

- Designed and implemented high-performance discrete-event simulators for large-scale network systems using Rust, focusing on scalability and efficiency.
- Developed scheduling strategies for collective communication operations (e.g., Broadcast, AllReduce) in GPU clusters for distributed training workloads.
- Gained practical experience in building performant, production-oriented systems, informing the design of industry-aligned coursework in distributed systems and cloud computing.

University of Toronto

Toronto, Ontario, Canada

Teaching Assistant

- *APS 105: Computer Fundamentals* Winter 2022
Head teaching assistant for 450 students, 28 teaching assistants, and 3 instructors.
- *ECE 1771: Quality of Service* Fall 2018, 2019, 2021, 2022
- *APS 105: Computer Fundamentals* Winter 2021
- *ECE 344: Operating Systems* Fall 2020
- *ECE 353: System Software* Winter 2019, 2020
- *CEAB Special Development Project* Sep 2017 – Aug 2018
Developed data analysis tools in Python (pandas) to evaluate student performance metrics.

EDUCATION

University of Toronto

Edward S. Rogers Sr. Department of Electrical and Computer Engineering

February 2023
Toronto, Ontario, Canada

Ph.D., Computer Engineering

- *Dissertation*: “Improving Training Performance in Federated Learning”

Wuhan University

Department of Computer Science

June 2017
Wuhan, Hubei, China

B.Eng., Computer Science and Technology

- *Ranked 2nd among 217 students*

TECHNICAL EXPERTISE

Programming	TypeScript/JavaScript, Python, Rust, Go, C/C++
Web & Mobile Development	Node.js, React, Next.js, React Native, Expo
Cloud & Distributed Systems	Docker, Kubernetes
AI Systems	Retrieval-augmented generation, local LLM deployment
Machine Learning	PyTorch, TensorFlow

PUBLICATIONS

Engineering Education

Chen Ying, “Bridging Coursework and Professional Practice through a Retrieval-Grounded, Privacy-Preserving AI Learning Companion,” in the *Canadian Engineering Education Association (CEEAA-ACÉG) Conference*, Moncton, Canada, June 2026.

Computer Systems and Machine Learning

Chen Ying, Baochun Li, “Pegasus: Efficient Asynchronous Three-Layer Federated Learning,” in the *Proceedings of the 34th International Conference on Computer Communications and Networks (ICCCN 2025)*, Tokyo, Japan, August 4–7, 2025.

Chen Ying, Baochun Li, Bo Li, “Blade: Pushing the Performance Envelope of Asynchronous Federated Learning,” in the *Proceedings of the IEEE/ACM International Symposium on Quality of Service (IWQoS 2024)*, Guangzhou, China, June 19–21, 2024.

Chen Ying, Baochun Li, Bo Li, “FedSaw: Communication-Efficient Cross-Silo Federated Learning with Adaptive Compression,” in the *Proceedings of the 20th IEEE International Conference on Mobile Ad Hoc and Smart Systems (MASS 2023)*, Toronto, Ontario, September 25–27, 2023.

Baochun Li, Ningxin Su, Chen Ying, Fei Wang, “Plato: An Open-Source Research Framework for Production Federated Learning,” in the *Proceedings of ACM Turing Award Celebration Conference (TURC)*, Wuhan, China, July 29–30, 2023.

Chen Ying, Baochun Li, Bo Li, “Tempo: Improving Training Performance in Cross-Silo Federated Learning,” in the *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2022)*, Singapore, May 22–27, 2022.

Chen Ying, Baochun Li, Xiaodi Ke, Lei Guo, “Scheduling Virtual Machine Migration during Datacenter Upgrades with Reinforcement Learning,” in the *Proceedings of the 15th EAI International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine 2019)*, Shenzhen, China, November 22–23, 2019.

Journal Paper

Chen Ying, Baochun Li, Xiaodi Ke, Lei Guo, “Raven: Scheduling Virtual Machine Migration during Datacenter Upgrades with Reinforcement Learning,” *Mobile Networks and Applications*, Springer, Special Issue on Advances in Mobile, Edge and Cloud Computing, August 2020.

HONOURS AND AWARDS

- *Edward S. Rogers Sr. Graduate Scholarship*, University of Toronto, 2017–2022.
- *Mitacs Globalink Graduate Fellowship*, Mitacs, 2017.
- *Outstanding Graduate*, Wuhan University, 2017.
- *National Scholarship*, China, 2016.
- *Honorable Mention in Mathematical Contest in Modeling*, 2016.
- *First Prize in National College Student Innovation Project Competition*, China, 2015.
- *Second Prize Scholarship*, Wuhan University, 2015.
- *Third Prize Scholarship*, Wuhan University, 2014.
- *Excellent Student*, Wuhan University, 2014, 2015, 2016.
- *Outstanding Individual Scholarship*, Wuhan University, 2014, 2015, 2016.
- *Distinguished Participant in Social Activity*, Wuhan University, 2014, 2015, 2016.