

Edward Lee

B.Math (Hons), M.Math, PhD (expected 2024)

Computer Science
University of Waterloo
200 University Ave West
Waterloo ON
N2L 3G1 CANADA

✉ e45lee@uwaterloo.ca

🌐 <https://plg.uwaterloo.ca/~e45lee>

Citizenship: Canadian

Education

- 2020– **PhD**, *Computer Science, University of Waterloo*, supervised by Ondřej Lhoták.
Topic: Effects and capabilities in Scala.
- 2015–2017 **Master's of Mathematics**, *Combinatorics and Optimization, University of Waterloo*, supervised by James Geelen.
- 2010–2015 **Bachelor's of Mathematics**, *University of Waterloo*.
Double Honours in Computer Science and Combinatorics and Optimization.

Academic Experience

- Fall 2021 – present **Instructor**, *School of Computer Science, University of Waterloo*.
 - Winter 2024 – CS 146, Elementary Algorithm Design and Data Abstraction (Advanced Level). 60 students.
 - Fall 2023 – CS 241, Foundations of Sequential Programs. 160 students.
 - Fall 2022 – CS 246, Object Oriented Software Development. 160 students.
 - Spring 2022 – CS 241, Foundations of Sequential Programs. 80 students.
 - Fall 2021 – CS 241E, Foundations of Sequential Programs (Enriched). 80 students.
- Winter 2020 – present **Instructional Apprentice**, *School of Computer Science, University of Waterloo*.
CS 146 (W2021, W2023), CS 241 (S2020, S2021, W2022), CS 246 (S2023)
- Winter 2020 – present **Teaching Assistant**, *School of Computer Science, University of Waterloo*.
CS 136 (F2017), CS 241E (F2020), CS 246E (F2020), CS444 – Compilers (W2020)
 - Fall 2015 – **Teaching Assistant**, *Department of Combinatorics and Optimization, University of Waterloo*.
 - Spring 2017 CO 331 – Error Correcting Codes (W2017), CO 370 – Optimization Models (F2015), CO 602 – Intro. Optimization (F2016), CO 446/646 – Matroids (S2017)
- May 2013 – **Software Developer**, *School of Computer Science, University of Waterloo*.
- August 2017
 - Part-time lead developer on a web-based C/Racket teaching and development environment for students; source available at <https://github.com/cs136/seashell>.

Scholarships and Awards

- 2023–2024 **Ontario Graduate Scholarship**.
- 2020–2023 **NSERC Postgraduate Scholarship – Doctoral (PGS-D)**.
- 2016–2017 **NSERC Canada Graduate Scholarship – Master's (CGS-M)**.
- 2015–2016 **Ontario Graduate Scholarship**.
 - Fall 2014, **NSERC Undergraduate Student Research Award**.
- Winter 2013,
- Spring 2011

Drafts

- OOPSLA 24 **Lee, Edward**, Zhao, Yaoyu, Lhoták, Ondřej, You, James, Satheeskumar, Kavin, and Brachthäuser, Jonathan Immanuel. *Qualifying System F-sub*. Accepted (to appear) at Object-Oriented Programming, Systems, Languages, and Applications 2024.

Publications

- OOPSLA 23 **Lee, Edward** and Lhoták, Ondřej. *Simple Reference Immutability for System F-sub*. Object-Oriented Programming, Systems, Languages, and Applications 2023: Article 252, October 2023. Cascais, Portugal.
- TOPLAS Boruch-Gruszecki, Aleksander, Odersky, Martin, **Lee, Edward**, Lhoták, Ondřej, and Brachthäuser, Jonathan Immanuel. *Capturing Types*. ACM Transactions on Programming Languages and Systems, accepted August 2023.
- FTfJP 23 **Lee, Edward**, Satheeskumar, Kavin, and Lhoták, Ondřej. *Dependency-free Capture Tracking*. Workshop for Formal Techniques for Java-like Programs 2023: pages 39–43, July 2023. Seattle, USA.
- OOPSLA 22 Brachthäuser, Jonathan Immanuel, Schuster, Philipp, **Lee, Edward** and Boruch-Gruszecki, Aleksander. *Effects, Capabilities, and Boxes: From Scope-based Reasoning to Type-based Reasoning and Back*. Object-Oriented Programming, Systems, Languages, and Applications 2022: Article 76, April 2022. Auckland, New Zealand.
- SCALA 21 Odersky, Martin, Boruch-Gruszecki, Aleksander, Brachthäuser, Jonathan Immanuel, **Lee, Edward**, and Lhoták, Ondřej. *Safer exceptions for Scala*. Scala Symposium 2021: pages 1–11, October 2021. Chicago, USA.
- TCS A Georgiou, Konstantions, **Lee, Edward**¹ et al. *Lift and Project Systems Performing on the Partial Vertex Cover Polytope*. Theoretical Computer Science A. Volume 820: pages 1–16, June 2020.
- SIGIR 19 Roegiest, Adam and **Lee, Edward**. *On Tradeoffs Between Document Signature Methods for A Legal Due Diligence Corpus*. SIGIR 2019: pages 1001–1004, July 2019. Paris, France.
- JGT Geelen, Jim and **Lee, Edward**¹. *Naji's characterization of circle graphs*. Journal of Graph Theory. Volume 93: pages 21–33, June 2019.
- FSTTCS 14 Georgiou, Konstantions and **Lee, Edward**¹. *Lift and Project Systems Performing on the Partial Vertex Cover Polytope*. Foundations of Software Technology and Theoretical Computer Science 2014: pages 199–211, December 2014. New Delhi, India.

Talks

- October 2023 **Simple Reference Immutability for System F-sub**, OOPSLA 2023, Cascais, Portugal.
July 2023 **Dependency-Free Capture Tracking**, FTfJP 2023, Seattle WA.
July 2017 **Recognizing Circle Graphs**, CANADAM 2017, Ryerson University, Toronto ON.
March 2017 **Circle Graph Obstructions**, Graphs @ Ryerson, Ryerson University, Toronto ON.

Service

- 2024 DEI Committee Member, Kitchener-Waterloo Granite (Curling) Club.
2022–2024 Undergraduate Academic Plans Committee, School of Computer Science, University of Waterloo.
2022–2023 Computer Science Graduate Student Association (Board Member), School of Computer Science, University of Waterloo.
2014–2015 Undergraduate Academic Plans Committee, School of Computer Science, University of Waterloo.

¹Authors listed in alphabetical order.

2023 President, University of Waterloo Curling Club.

Industrial Experience

- October 2017 **Software Developer**, *Kira Systems*.
- December 2019
 - Jointly designed and implemented with Kira's research team a new service for grouping documents based on their semantic similarity.
 - Optimized the core ML algorithms that Kira used, reducing both memory usage and time spent training new models by a significant factor.
- January 2013 **Software Engineering Intern**, *Google Kitchener*.
- April 2013
 - Helped implement a new storage system for the Ads Experiments group.