

Danya Lette

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EDUCATION

- **University of Toronto** Ongoing
Ph.D. in Computer Science (anticipated graduation 2027)
- **University of Toronto** 2023
M.Sc. in Computer Science
- **University of Toronto** 2021
B.Sc. (Hons) in Computer Science
- **University of Toronto** 2013
B.A. (Hons) in Philosophy

RESEARCH INTERESTS

Automated formal verification, program synthesis, programming language theory, concurrency.

PUBLICATIONS

- [1] **Danya Lette** and Azadeh Farzan. 2023. Commutativity for concurrent program termination proofs. In *Computer Aided Verification*. Constantin Enea and Akash Lal, editors. Springer Nature Switzerland, Cham, 109–131. ISBN: 978-3-031-37706-8.
- [2] Azadeh Farzan, **Danya Lette**, and Victor Nicolet. 2022. Recursion synthesis with unrealizability witnesses. In *Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation (PLDI 2022)*. Association for Computing Machinery, San Diego, CA, USA, 244–259. ISBN: 9781450392655.

TEACHING

- **Teaching Assistant** at University of Toronto 2019-present
 - CSC410: Software Testing and Verification (Fall 2021, Fall 2022)
 - CSC111: Foundations of Computer Science II (Winter 2021)
 - CSC165: Mathematical Expression and Reasoning (Winter 2020)
 - CSC324: Principles of Programming Languages (Fall 2019, Winter 2022)
 - CSC148: Introduction to Computer Science (Winter 2019)

As a teaching assistant, I have led tutorials, designed assessments, graded assignments, assisted students one-on-one during office hours, managed student discussion forums, and invigilated exams.

AWARDS

- Bell Graduate Scholarship (2022)
- Thriver Prize in Computer Science (2021)
- NSERC Undergraduate Student Research Award (2020, 2021)
- Dean's List (2019, 2020)

LEAVES OF ABSENCE

- Parental Leave (June 2023-September 2024)

RESEARCH

- **Commutativity For Concurrent Program Termination Proofs** Ongoing
This work explores how using commutativity can improve the efficiency and efficacy of algorithmic termination checking for concurrent programs by exploiting equivalence classes. We incorporate and expand upon classic bounded commutativity in the context of termination. We implemented this work in tool written in Python and C++. This work resulted in a conference paper, presented at CAV 2023.
- **Synthesis of Recursive Programs** Summer 2021
The aim of this project is a bounding method for the synthesis of a recursive function over recursive input data types, in which the synthesis problem is specified by an input reference function and a recursion skeleton. We implemented the result in a tool called Synduce written in OCAML. This work resulted in a conference paper, presented at PLDI 2022. (Funding: NSERC UGSRP)
- **Symmetry Reduction for Verification of Concurrent Programs** Summer 2020
I investigated the use of symmetry reductions for efficient automated formal verification of programs exhibiting a high degree of symmetry such as multi-threaded programs. I formalized the notion of symmetry in the context of trace abstraction, designed algorithms for symmetry-reduced verification, and evaluated the algorithms for efficiency, soundness and completeness. I subsequently implemented these algorithms in an automated formal verification tool written in Haskell. (Funding: NSERC UGSRP)

EMPLOYMENT

- **Software Developer** 2013-2017
 - Mercatus (Oct 2015-Nov 2016)
 - Toronto International Film Festival (Dec 2014-Aug 2015)
 - Freelance (2013-2017)

CO-CURRICULAR

- **Review of Undergraduate Computer Science (RUCS)** 2017-2020
 - Senior Advisor (2019-2020)
 - Editor-in-Chief (2018-2019)
 - Editor (2017-2018)

The Review of Undergraduate Computer Science (RUCS) is a non-archival open-access journal founded in 2015. We publish one edition per year featuring undergraduate computer science research at the University of Toronto and elsewhere. As an editor, I evaluated, reviewed, and edited submissions. As editor-in-chief, I led a team of eight volunteers in publishing our yearly edition. In addition, I spearheaded several new projects such as a website redesign, publication of the Undergraduate Research Guide, and several student outreach initiatives such as the UGSRP Meet & Greet and the RUCS/TURCS Speaker Series.

- **CS Research-A-Thon** Winter 2019, Winter 2020
Founder & Lead Organizer

As the founder and lead organizer of the CS Research-A-Thon, my responsibilities included event planning, writing and giving presentations for Research-A-Thon participants, recruiting and leading a team of volunteers, and communicating with faculty members and students to devise miniature research projects for participants.