

Ellen Arteca

Education

- 2018–date **PhD in Computer Science**, *Northeastern University*, Boston, USA.
Current work: Program Analysis for JavaScript optimization and/or refactoring; test generation
Supervised by Dr. Frank Tip
- 2016–2018 **MMath in Computer Science**, *University of Waterloo*, Waterloo, Canada.
Thesis: Formal Semantics and Mechanized Soundness Proof for Fast Gradually Typed JavaScript
Supervised by Dr. Gregor Richards
- 2012–2016 **Bachelor's of Computer Science, Major in Mathematics**, *Laurentian University*, Sudbury, Canada.
Thesis: Modular Algorithms for Computation of Groebner Bases
Supervised by Dr. Stephanie Czapor

Relevant Professional Experience

- Summer 2021 **Applied Science Intern**, *Automated Reasoning Group, Amazon Web Services*.
 - Homomorphic transformations on SMT queries
 - Building a dataflow framework for SMT queries in Rust
 - Generating equisatisfiable queries with all string literals anonymized
 - Code is open sourced: [aws-labs/rust-smt-ir](https://github.com/aws-labs/rust-smt-ir)/[amzn-smt-string-transformer](https://github.com/aws-labs/amzn-smt-string-transformer)
- Summer 2019 **Research Engineer Intern**, *GitHub (Semmle)*.
 - Static analysis for bug detection in use of event-driven APIs in JavaScript
 - Building a model of the API through large-scale analysis of package use
 - Automatically determining incorrect event listener registrations
- Fall 2014 **UCOSP: Umple Model-Oriented Programming**, *University of Ottawa*.
 - Implementation of UML compositions in Umple compiler and addition to UmpleOnline interface
- Summer 2014 **Research Assistant (USRA)**, *Laurentian University*, Funded by NSERC.
 - Modelling in computational physics, simulating particle interaction dynamics in large enclosed systems
- 2013–2016 **Research Assistant**, *Laurentian University*.
 - Modelling in computational ecology, simulating fruit fly populations under variable environmental conditions
 - Numerical approximations for populations as systems of coupled DEs
 - Multithreading in Java and C++
 - Large-scale data storage and analysis
- 2013–2021 **Teaching Assistant**.
 - Marking and running tutorials for a variety of computer science and math courses

Publications

- In submission Arteca, Ellen and Turcotte, Alexi. *npm-filter: Automating the mining of dynamic information from npm packages*. Proceedings of the 19th International Conference on Mining Software Repositories (MSR 2022).
- In revisions Turcotte, Alexi and Arteca, Ellen, Ashish Mishra, Saba Alimadadi, and Frank Tip. *Stubbi-fier: Debloating Dynamic Server-Side JavaScript Applications*. Empirical Software Engineering (2022).
- 2022 Arteca, Ellen, Sebastian Harner, Michael Pradel, and Frank Tip. *Nessie: Automatically Testing JavaScript APIs with Asynchronous Callbacks*. Proceedings of the 44th International Conference on Software Engineering, ICSE (2022).
- 2022 Arteca, Ellen, Max Schäfer, Frank Tip. *Learning How to Listen: Automatically Finding Bug Patterns in Event-Driven JavaScript APIs*. IEEE Transactions on Software Engineering.
- 2021 Arteca, Ellen, Frank Tip, Max Schäfer. *Enabling Additional Parallelism in Asynchronous JavaScript Applications*. ECOOP 2021 European Conference on Object-Oriented Programming, 2021.
- 2019 Turcotte, Alexi, Ellen Arteca, and Gregor Richards. *Reasoning About Foreign Function Interfaces Without Modelling the Foreign Language*. ECOOP 2019 European Conference on Object-Oriented Programming, 2019.
- 2017 Richards, Gregor, Ellen Arteca, and Alexi Turcotte. *The VM Already Knew That: Leveraging Compile-Time Knowledge to Optimize Gradual Typing*. Proceedings of the ACM on Programming Languages, OOPSLA (2017).
- 2017 Langille, Aaron, Ellen Arteca, and Jonathan Newman. *The impacts of climate change on the abundance and distribution of the Spotted Wing Drosophila (Drosophila suzukii) in the United States and Canada*. PeerJ 5 (2017).
- 2016 Langille, Aaron, Ellen Arteca, Geraldine Ryan, Lisa Emiljanowicz, and Jonathan Newman. *North American invasion of Spotted-Wing Drosophila (Drosophila suzukii): a mechanistic model of population dynamics*. Ecological Modelling (2016).

Professional Development

- 2020 ISSTA, ECOOP Artifact Evaluation Committee
- 2019 PhD Curriculum Committee, Northeastern University
- 2018 ECOOP Summer School
- 2017 Programming Languages Implementation Summer School (audit)

Languages

- Programming Rust, Typescript/Javascript, CodeQL, Python (with matplotlib, numpy, pandas), Java, C++, C, Matlab/Octave, Maple, Coq, Racket
- Natural English (native), Spanish (fluent), French (fluent)

Misc

- Github emarteca
- Citizenship Canadian
- Hackathons A variety of game design hackathons during undergrad!
- NSERC Currently holding the NSERC PGS-D scholarship