

# Ellen Arteca

## Education

- 2018–2023 **PhD in Computer Science**, *Northeastern University*, Boston, USA.  
Thesis: Leveraging large code bases for bug detection and 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 2022 **Software Engineering Intern**, *Android Rust (Android Security), Google*.
- Extension of MIRI with C FFI support
    - Allow data flow between interoperating C and Rust programs running in MIRI (including synchronizing of shared C process memory and MIRI abstract memory)
    - Code is open sourced: [emarteca/miri](https://github.com/emarteca/miri)
  - Integration into Android Rust toolchain for use as a sanitizer on unsafe Rust
- 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-examples/amzn-smt-string-transformer](https://github.com/aws-labs/rust-smt-ir-examples/amzn-smt-string-transformer)
- Summer 2019 **Research Engineer Intern**, *GitHub (Semmler)*.
- 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

## Select Publications

- In submission Silva, Denini, Martin Gruber, Satyajit Gokhale, Ellen Arteca, Alexi Turcotte, Marcelo d'Amorim, Wing Lam, Stefan Winter, and Jonathan Bell. *The Effects of Computational Resources on Flaky Tests* In submission to IEEE Transactions on Software Engineering (2023).
- arXiv preprint Arteca, Ellen, Max Schäfer, Frank Tip. *A statistical approach for finding property-access errors*. ACM Symposium on the Foundations of Software Engineering (2023).
- 2022 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).
- 2022 Turcotte, Alexi and Arteca, Ellen, Ashish Mishra, Saba Alimadadi, and Frank Tip. *Stubbfier: 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).

## 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, Python (with matplotlib, numpy, pandas), TypeScript/JavaScript, CodeQL, Java, C++, C, Matlab/Octave, Maple
- Natural English (native), Spanish (fluent), French (fluent)

## Misc

- Github emarteca
- Citizenship Canadian
- Hackathons A variety of game design hackathons during undergrad!
- NSERC 2018-2021 supported by NSERC PGS-D scholarship