Khoury College of Computer Science
Northeastern University
Boston, MA, USA
+1 (781) 816 7847
arteca.e [at] northeastern.edu
emarteca.github.io

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: awslabs/rust-smt-ir/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

2013-2019 **Teaching Assistant**.
- Marking and running tutorials for a variety of computer science and math courses

Publications

In submission Turcotte, Alexi and Arteca, Ellen, Ashish Mishra, Saba Alimadadi, and Frank Tip. *Stubbifier: Debloating Dynamic JavaScript Applications*. Empirical Software Engineering (2021).

In submission	Arteca, Ellen, Sebastian Harner, Michael Pradel, and Frank Tip. *Nessie: Automatically Testing JavaScript APIs with Asynchronous Callbacks*. Proceedings of the International Conference on Software Engineering, ICSE (2021).
In revisions	Arteca, Ellen, Max Schäfer, Frank Tip. *Learning How to Listen: Automatically Finding Bug Patterns in Event-Driven JavaScript APIs*. IEEE Transactions on Software Engineering (TSE).
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/ bitbucket	emarteca
Citizenship	Canadian
Hackathons	A variety of game design hackathons during undergrad!
NSERC	Currently holding the NSERC PGS-D scholarship