Caroline Lemieux

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Education

University of California, Berkeley   *2016–Present (expected 2021)*
  Ph.D. in Computer Science
  Advisor: Koushik Sen

University of British Columbia   *2012-2016*
  B.Sc. in Combined Honours Computer Science and Mathematics
  Graduated with highest standing in Faculty of Science (Governor General's Silver Medal)

Publications

I have published full papers at **ICSE**, **OOPSLA**, **ISSTA**, **ASE**, and **ESEC/FSE Industry Track**.

Refereed Conference Publications

[1]
pdf
Sameer Reddy, <u>Caroline Lemieux</u>, Rohan Padhye, Koushik Sen. *Quickly Generating Diverse Valid Test Inputs with Reinforcement Learning.* In Proceedings of the 42nd International Conference on Software Engineering, July 2020.

[2]
pdf
Rohan Bavishi, <u>Caroline Lemieux</u>, Roy Fox, Koushik Sen, Ion Stoica. *AutoPandas: Neural-Backed Generators for Program Synthesis.* In PACMPL, Volume 3, Issue OOPSLA, October 2019.

[3]
pdf
Rohan Padhye, <u>Caroline Lemieux</u>, Koushik Sen, Laurent Simon, Hayawardh Vijayakumar. *FuzzFactory: Domain-Specific Fuzzing with Waypoints.* In PACMPL, Volume 3, Issue OOPSLA, October 2019.

[4]
pdf
Domagoj Babic, Stefan Bucur, Yaohui Chen, Franjo Ivancic, Tim King, Markus Kusano, <u>Caroline Lemieux</u>, Lászó Szekeres, Wei Wang. *FUDGE: Fuzz Driver Generation at Scale.* In Proceedings of the 2019 27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering, August 2019. Industry Track. **Best Paper Award, Industry Track**

[5]
pdf
Rohan Padhye, <u>Caroline Lemieux</u>, Koushik Sen, Mike Papadakis, Yves Le Traon. *Semantic Fuzzing with Zest.* In Proceedings of the 28th International Symposium on Software Testing and Analysis, July 2019. **Distinguished Artifact Award**.

[6]
pdf
<u>Caroline Lemieux</u>, Koushik Sen. *FairFuzz: A Targeted Mutation Strategy for Increasing Greybox Fuzz Testing Coverage.* In Proceedings of the 33rd International Conference on Automated Software Engineering (ASE), September 2018.

[7]
pdf
<u>Caroline Lemieux</u>, Rohan Padhye, Koushik Sen, Dawn Song. *PerfFuzz: Automatically Generating Pathological Inputs.* In Proceedings of the 27th International Symposium on Software Testing and Analysis, July 2018. **Distinguished Paper Award.**

[8]
pdf
<u>Caroline Lemieux</u>, Dennis Park, Ivan Beschastnikh. *General LTL Specification Mining.* In Proceedings of the 30th International Conference on Automated Software Engineering (ASE), November 2015.

Refereed Short Papers/Workshop Publications

[9]
pdf
Rohan Padhye, <u>Caroline Lemieux</u>, Koushik Sen. *JQF: Coverage-Guided Property-Based Testing in Java.* In Proceedings of the 28th International Symposium on Software Testing and Analysis, July 2019. Tool demo. **Best Tool Demonstration Award**.

[10]
pdf
Rohan Padhye, <u>Caroline Lemieux</u>, Koushik Sen, Mike Papadakis, Yves Le Traon. *Validity Fuzzing and Parametric Generators for Effective Random Testing.* In Proceedings of the 41st International Conference on Software Engineering (ICSE), May 2019. (Posters Track).

[11]
pdf
Rohan Bavishi, <u>Caroline Lemieux</u>, Neel Kant, Roy Fox, Koushik Sen, Ion Stoica. *Inference of API Functions from Input-Output Examples.* In Workshop on ML for Systems at NeurIPS 2018, December 2018.

[12]
pdf
<u>Caroline Lemieux</u>, Ivan Beschastnikh. *Investigating Program Behavior Using the Texada LTL Specifications Miner.* In Proceedings of the 30th International Conference on Automated Software Engineering (ASE), November 2015. (Tool Demonstration Track)

[13]
pdf
<u>Caroline Lemieux</u>. *Mining Temporal Properties of Data Invariants.* In Proceedings of the 37th International Conference on Software Engineering (ICSE), May 2015. (ACM SRC Research Abstract; **won 1st place in Undergraduate Category**)

Invited Talks

Expanding the Reach of Fuzzing	*Sep 2020*
at FuzzCon Europe.	
Quickly Generating Diverse Valid Test Inputs with Reinforcement Learning	*May 2020*
at ISCA workshop on ML for Computer Architecture and Systems.	
Expanding the Reach of Fuzzing	*Mar 2020*
at Tutte Institute for Mathematics and Computing.	
Quickly Generating Diverse Valid Test Inputs with Reinforcement Learning	*Feb 2020*
at Google Brain.	
Expanding the Reach of Fuzzing	*Jan 2020*
at Facebook.	
Expanding the Reach of Fuzzing	*Dec 2019*
at Bay Area Fuzzing Meetup 2.	
Expanding the Reach of Fuzz Testing: From Syntax Errors to Program Synthesis	*Nov 2019*
at University of Massachusetts Amherst Rising Stars Lecture Series.	
A View of Programming Languages and Software Engineering for ML Software	*Oct 2019*
at Workshop on AI Systems at SOSP'19.	
Expanding the Reach of Fuzz Testing	*Nov 2018*
at CISPA Helmholtz Center for Information Security.	
DifFuzz: Making Greybox Fuzzing Incremental	*Nov 2018*
at Facebook Testing and Verification Symposium.	

Grant Writing Contributions

All grants had Koushik Sen as PI/Co-PI.

Facebook: DiffFuzz: Making Greybox Fuzzing Incremental	*2018*
NSF: Machine Learning for Effective Fuzz Testing	*2017*
NSF: Input Content-Aware Effective Greybox Fuzz Testing	*2017*

Service

NeurIPS 2020 Workshop on Computer-Assisted Programming Program Committee	*2020*
ASPLOS 2021 External Review Committee	*2020*
OOPSLA 2020 Artifact Evaluation Committee	*2020*
Distinguished Artifact Reviewer Award	
Reviewer, IEEE Software	*2020*
ESEC/FSE 2020 Tool Demos Program Committee	*2020*
ICST 2020 Posters Program Committee	*2020*
Reviewer, Transactions on Software Engineering	*2019*
Reviewer, Software: Testing, Verification and Reliability	*2019*
TAP 2019 (International Conference on Tests and Proofs) Program Committee	*2019*
Student Review Commitee, UC Berkeley EECS PhD Admissions	*2018*
ICSE 2019 Demonstrations Program Committee	*2018*
ICSE 2018 Poster Session Program Committee	*2018*
Subreviewer: PLDI'17, ASPLOS'18, PLDI'18, CAV'18, ICST'20, ICST'21	*2016-2020*

Experience

Graduate Student Researcher	*2016-Present*
Working with Koushik Sen at UC Berkeley, on fuzz testing and program synthesis.	
Graduate Student Instructor	*2019*
For CS164, intro to compilers, taught by Koushik Sen. Ran discussion section and office hours. Created discussion worksheets. Created and graded exam material.	
Graduate Student Instructor	*2019*
For CS61A, Berkeley's introductory computer science course, taught by Dan Garcia. Ran two discussions for regular CS61A material, as well as an extra lecture series.	
Google Software Engineering Intern	*2018*
Hosted by Stefan Bucur, built a static analysis tool to automatically generate fuzz targets.	
Micorosft Research Intern	*2017*
Worked in the CloudBuild team on automated detection of build error anomalies.	
Research Assistant (Volunteer, USRA)	*2014-2016*
Worked with Ivan Beschastnikh at UBC on specification mining tools.	
Undergraduate Academic Assistant	*2013-2014*
With Gregor Kiczales at UBC – edited video lectures and online TA for Coursera.	
Undergraduate Teaching Assistant	*2013*
In-class TA for CPSC 110 (UBC's introductory CS course) taught by Meghan Allen.	

Organization & Outreach

Berkeley Programming Systems Seminar/Social Hour Organizer *2020-Present*
Coordinating student presentations for weekly seminar series. Bootstrapped virtual social hour to increase engagement in research group for first-year graduate students.

Berkeley Programming Systems Virtual Visit Days Organizer *2020*
Organized *virtual* days activities for admitted students, on short notice. Coordinated faculty talk format. Organized 1-1s for each admitted student with 3-4 existing graduate students. Heard from several admitted students that it was the best organized virtual visit days.

Treasurer, Berkeley Women in Computer Science and Electrical Engineering *2018-2019*
Treasurer functions included applying for funding, coordinating with industry sponsors, organizing the budget and handling reimbursement. Helped organize Berkeley-Stanford research and mentorship meetup.

Berkeley Programming Systems Visit Days Organizer *2018*
Organized visit day activities for admitted students, including choosing social activities, coordinating talks, and helping coordinate catering.

Social Chair, Berkeley Women in Computer Science and Electrical Engineering *2017-2018*
Social chair functions included organizing the first-year grad mentoring program, the EECS-wide grad student holiday party and WICSE brunch for prospective students at visit days.

Awards and Scholarships

International

Google PhD Fellowship in Programming Technology and Software Engineering	**2019**
Finalist, CRA Outstanding Undergraduate Researcher Award	**2016**
1st Place Undergraduate, ACM Student Research Competition at ICSE 2015	**2015**
Honorable Mention, CRA Outstanding Undergraduate Researcher Award	**2015**

National

NSERC CGS D (declined)	**2016**
NSERC Undergraduate Student Research Award (supervisor: Ivan Beschastnikh)	**2014, 2015**

Institutional - UCB

Demetri Angelakos Memorial Achievement Award	**2019**
Berkeley Fellowship for Graduate Study	**2016**
EECS Excellence Award	**2016**

Institutional - UBC

Governor General's Silver Medal (best in the graduating class for the B.Sc. degree)	**2016**
Markus Meister Memorial Prize in Computer Science	**2016**
G C Webber Memorial Prize	**2016**
Daniel Buchanan Scholarship in Mathematics (highest standing in Honours Math)	**2015**

Natural Languages

French (Fluent), English (Fluent), Spanish (Basic)