

curriculum vitae of
Jacob Scott Laurel

🏠 <https://jsl1994.github.io/> ✉ jlaurel2@illinois.edu

EDUCATION

Aug. 2017 – present	Ph.D. in Computer Science Advisor: Sasa Misailovic Research area: Probabilistic and Differentiable Programming Languages, Abstract Interpretation, Neural Network Verification and Approximate Computing	UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Aug. 2012 – May 2017	B.S. in Mathematics (summa cum laude) B.S.E.E in Electrical Engineering (summa cum laude)	UNIVERSITY OF ALABAMA AT BIRMINGHAM

WORK EXPERIENCE

July 2018 – Present	Research Assistant Advisor: Sasa Misailovic	UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN
May 2019 – Aug. 2019	Ph.D. Research Intern Mentors: Cesar Munoz and Aaron Dutle Applied Program Analysis to quantify floating point error in probabilistic programs	NASA LANGLEY RESEARCH CENTER
May 2016 – Aug. 2016	Undergraduate Research Intern Helped develop a novel video summarization technique using LSTM Deep Neural Networks. Work published in CVPR 2017 (7)	UNIVERSITY OF CENTRAL FLORIDA

PUBLICATIONS

CONFERENCE AND JOURNAL PUBLICATIONS

1. **Jacob Laurel**, Rem Yang, Shubham Ugare, Robert Nagel, Gagandeep Singh, Sasa Misailovic. A General Construction for Abstract Interpretation of Higher-Order Automatic Differentiation. *Accepted* to appear in *Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2022)*. Acceptance rate: 31%.
2. Rem Yang, **Jacob Laurel**, Sasa Misailovic, Gagandeep Singh. Training Certifiably Robust Neural Networks Against Semantic Perturbations. (**Arxiv 2022**).
3. **Jacob Laurel**, Rem Yang, Gagandeep Singh, Sasa Misailovic. A Dual Number Abstraction for Static Analysis of Clarke Jacobians. In *Symposium on Principles of Programming Languages (POPL 2022)*. Acceptance rate: 23%.
4. Vimuth Fernando, Keyur Joshi, **Jacob Laurel**, Sasa Misailovic. Diamont: Dynamic Monitoring of Uncertainty for Distributed Asynchronous Programs. In *21st International Conference on Runtime Verification (RV 2021)*. Acceptance rate: 38%.
5. **Jacob Laurel**, Rem Yang, Atharva Seghal, Shubham Ugare, Sasa Misailovic. Statheros: A Compiler for Efficient Low-Precision Probabilistic Programming. In *58th Design Automation Conference (DAC 2021)*. Acceptance rate: 23%.
6. **Jacob Laurel**, Sasa Misailovic. Continualization of Probabilistic Programs with Correction. In *29th European Symposium on Programming (ESOP 2020)*. Acceptance rate: 31%.
7. Aidean Sharghi, **Jacob Laurel**, Boqing Gong. Query-Focused Video Summarization: Dataset, Evaluation, and A Memory Network Based Approach. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2017)*. Acceptance rate: 29%.

POSTERS

8. **Jacob Laurel.** Exact Quantification of Continuity Correction Error in Probabilistic Programs. Poster presented at 1st International Conference on Probabilistic Programming (*PROBPROG 2018*).

HONORS

2020-Present	UIUC LEAP Fellow
2017-Present	UIUC Sloan UCEM Scholarship
2012-2017	UAB Presidential Honors List for 4.0 GPA during semester
2012-2016	UAB Presidential Scholarship as National Hispanic Recognition Program Scholar
2015	UAB School of Engineering Undergraduate Research Award for Honors Research
2015	UAB School of Engineering Dean's Scholarship
2013	Inducted into Tau Beta Pi

TALKS AND PRESENTATIONS

Summer 2022	<i>Abstract Interpretation for Differentiable Programming</i> - Stanford Software Seminar (host: Clark Barrett)
	<i>Abstract Interpretation for Differentiable Programming</i> - UC Berkeley Formal Methods Seminar (host: Sanjit Seshia)
Fall 2021	<i>Statheros: A Compiler for Efficient Low-Precision Probabilistic Programming</i> - UIUC Compilers Seminar

TEACHING

Fall 2019	CS 421 Programming Languages and Compilers
Spring 2019	CS 126 Software Design Studio
Fall 2018	CS 173 Discrete Structures
Spring 2018	CS 374 Algorithms and Models of Computation

UNDERGRADUATE MENTORING

Feb. 2020-present	Rem Yang - Co-author on (3,5,2,1)
Mar. 2020-May 2021	Atharva Seghal - Co-author on (5)
May. 2021-present	Robert Nagel - Co-author on (1)

SERVICE

Summer 2022	Reviewer - ECCV 2022
Summer 2022	Artifact Evaluation Committee - SAS 2022
Summer 2021	Artifact Evaluation Committee - OOPSLA 2021
Mar. 2020	Graduate Ambassador for UIUC CS Visit Day
Jan. 2020	Graduate Volunteer for UIUC School of Engineering Undergraduate Research Expo
Fall 2019	Organizer - UIUC Brett Daniel Software Engineering Seminar

OTHER EXPERIENCES

Dec. 2020	Attended Microsoft Research Ph.D. Summit as UIUC LEAP Fellow
Fall 2019	Attended Sloan Institute on Teaching and Mentoring Conference in Atlanta, GA
Fall 2019	Attended Midwest PL Summit at Purdue University
Summer 2018	Attended Oregon Programming Languages Summer School (OPLSS)