

Rem Yang

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Education

Massachusetts Institute of Technology Ph.D. in Computer Science	2023 – now
University of Illinois Urbana-Champaign B.S. in Computer Science, Highest Honors	2019 – 2023

Publications

- [1] **Provable Defense Against Geometric Transformations**
Rem Yang, Jacob Laurel, Sasa Misailovic, and Gagandeep Singh
International Conference on Learning Representations (ICLR) 2023, *notable top 25%*
- [2] **A General Construction for Abstract Interpretation of Higher-Order Automatic Differentiation**
Jacob Laurel, Rem Yang, Shubham Ugare, Robert Nagel, Gagandeep Singh, and Sasa Misailovic
ACM SIGPLAN Conference on Object-oriented Programming, Systems, Languages, and Applications (OOPSLA) 2022
- [3] **A Dual Number Abstraction for Static Analysis of Clarke Jacobians**
Jacob Laurel, Rem Yang, Gagandeep Singh, and Sasa Misailovic
ACM SIGPLAN Symposium on Principles of Programming Languages (POPL) 2022
- [4] **Statheros: Compiler for Efficient Low-Precision Probabilistic Programming**
Jacob Laurel, Rem Yang, Atharva Sehgal, Shubham Ugare, and Sasa Misailovic
ACM/IEEE Design Automation Conference (DAC) 2021

Research papers and code repositories are available on [my personal webpage](#).

Research Experience

Connected Systems Lab *UIUC*
Advised by Prof. Deepak Vasisht Spring 2022 – Spring 2023

- Developed self-supervised approach that leverages multimodal data to improve satellite image segmentation under challenging weather conditions and limited labels
- Built frequency-modulated continuous-wave radar that can track movement and wireless reflector that can mimic human motion

Approximate and Resilient Computing (ARC) Group & Formally Certified Automation and Learning (FOCAL) Lab *UIUC*
Advised by Profs. Sasa Misailovic & Gagandeep Singh Spring 2020 – Spring 2023

- Created the first system for constructing neural networks to be provably robust against real-world geometric transformations; resulted in paper [1]
- Constructed static analyses that can provably bound the first- and higher-order derivatives of numerical programs over a set of inputs; resulted in papers [2] and [3]
- Developed compiler for fixed-point precision probabilistic programming to accelerate Bayesian inference on embedded systems; resulted in paper [4]

Teaching and Work Experience

CS 225 Data Structures

UIUC

Course Assistant

Aug 2020 – May 2021

- Explained data structures concepts and addressed student questions during weekly lab sections
- Held weekly office hours to help students on programming assignments

CS 126 Software Design Studio

UIUC

Course Assistant

Jan 2020 – May 2020

- Led weekly code reviews, facilitating project presentations and discussions of best practices in program design, style, and testing
- Graded five students' weekly projects, with emphasis on detailed and individual feedback

Psyonic

Champaign, IL

Mobile Application Developer Intern

Sep 2020 – Dec 2020

- Developed React Native app that controls the company's bionic arm; deployed on Android and iOS
- Programmed interface for changing robotic hand's grips and toggles

Awards

Highest Honors in Computer Science, UIUC (2023)

ICLR Spotlight Paper (2023): [1] designated as top 25% of accepted papers; presented an oral talk at the Eleventh International Conference on Learning Representations in Kigali, Rwanda

CRA Outstanding Undergraduate Researcher Award Honorable Mention (2023): nominated by home department (one of four) and selected by the Computing Research Association

Leadership

Illinois Computer Science Sail

UIUC

Tech Team Advisor

Jul 2020 – May 2021

- Mentored tech team of Sail, an annual outreach event where high school students attend CS classes taught by UIUC students
- Deployed new website to Apache server and set up MySQL database

Tech Team Lead

Nov 2019 – Jun 2020

- Created new website from scratch with Django, which streamlined teacher course creation, student registration, and administrative tasks like mass-mails and event check-in; used by 300+ high school and 100+ college students
- Co-organized Sail 2020 with team of twelve; managed website and event registration logistics

Developer Student Club

UIUC

Outreach Staff Member

Nov 2019 – May 2020

- Prepared lessons and labs for Google technologies, such as Firebase and Flutter, with team of five
- Led an Introduction to Flutter workshop, presented to 20 members