

Research Interest

My research interest lies in the intersection of **Machine Learning** and **Programming Languages**.

Education

University of Illinois at Urbana-Champaign [*PhD*] 2020 -

Computer Science (Adviser: Prof. Sasa Misailovic, Prof. Gagandeep Singh)

Indian Institute of Technology, Guwahati [*BTech*] 2014 - 2018

Computer Science and minor in Mathematics

Publications

- **Improving LLM Code Generation with Grammar Augmentation**
[Shubham Ugare](#), Tarun Suresh, Hango Kang, Sasa Misailovic, Gagandeep Singh
[In submission](#)
- **Incremental Randomized Smoothing Certification**
[Shubham Ugare](#), Tarun Suresh, Debangshu Banerjee, Gagandeep Singh, Sasa Misailovic
[ICLR 2024](#)
- **Toward Continuous Verification of DNNs**
[Shubham Ugare](#), Debangshu Banerjee, Tarun Suresh, Sasa Misailovic, Gagandeep Singh
[Workshop @ ICML 2023](#)
- **Incremental Verification of Neural Networks**
[Shubham Ugare](#), Debangshu Banerjee, Sasa Misailovic, Gagandeep Singh
[PLDI 2023](#)
- **TeAAL: A Declarative Modeling Framework for Sparse Tensor Accelerators**
Nandeeka Nayak, Toluwanimi Odemuyiwa, [Shubham Ugare](#), Christopher Fletcher, Michael Pellauer, Joel Emer
[MICRO 2023](#), [Workshop @ PLDI 2023](#)
- **A General Construction for Abstract Interpretation of Higher-Order Automatic Differentiation**
Jacob Laurel, Rem Yang, [Shubham Ugare](#), Robert Nagel, Gagandeep Singh, Sasa Misailovic
[OOPSLA 2022](#)
- **Proof Transfer for Fast Certification of Multiple Approximate Neural Networks**
[Shubham Ugare](#), Gagandeep Singh, Sasa Misailovic
[OOPSLA 2022](#)
- **Statheros: A Compiler for Efficient Low-Precision Probabilistic Programming**
Jacob Laurel, Rem Yang, Atharva Sehgal, [Shubham Ugare](#), Sasa Misailovic
[DAC 2021](#)

- **Secure Medical Image Analysis with CrypTFlow***
Javier Alvarez-Valle, Pratik Bhatu, Nishanth Chandran, Divya Gupta, Aditya Nori, Aseem Rastogi, Mayank Rathee, Rahul Sharma, Shubham Ugare
Workshop @ NeurIPS 2020
 - **Approximate Query Processing over Static Sets and Sliding Windows***
Ran Ben Basat, Seungbum Jo, Srinivasa Rao Satti, Shubham Ugare
ISAAC 2018 and TCS 2021
- (* marked author names are alphabetically sorted)

Work Experience

- **Uber** [*Research Software Engineering Intern*] *Summer 22', Summer 23'*
– Using *large language models* for automated code fixes using code reviews
– *Static analysis* tool to detect potential nil panics in Go
- **Microsoft Research** [*Research Software Engineer*] *Oct 2019 - Jul 2020*
– Worked on SeeDot *compiler* that performs fixed-point compilation of ML models
- **Uber** [*Software Engineer*] *July 2018 - Oct 2019*
– Worked on NullAway *static program analysis* tool to statically find JAVA NPEs
– Worked on Uber Lite, Uber bus applications
- **Max Plank Institute of Software Systems, Germany** [*Research fellow*] *Summer 18'*
– Worked on using *machine learning* techniques for invariant synthesis
- **Seoul National University** [*Research Intern*] *Summer 17'*
– Worked on finding succinct data structures to solve query processing problems

Achievements

ACM ICPC: Ranked **5th** in *ACM ICPC Asia Regionals 2018*
Goldman Sachs Quantify: **1st** rank with 3500+ participants
Codenation 2017: **4th** rank in the contests with 8000+ participants

Teaching

Teaching Assistant, CS421 Programming Languages & Compilers, UIUC Fall 2020
 Teaching Assistant, CS521 Advanced Topics in Programming Systems, UIUC Spring 2024

Service

Organizer: NNV workshop @ ICML 2023, UIUC compiler seminar
Reviewer: TMLR, JMLR
Artifact Reviewer: CAV 2024