Shubham Ugare

shubhamdugare@gmail.com

Research Interest

My broad research interest lies in the intersection of **Programming Languages** and **Machine Learning**. Specifically, I'm interested in program analysis techniques and their applications for AI safety.

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*

Major in Computer Science and minor in Mathematics

Publications

- **Incremental Randomized Smoothing Certification**
  Shubham Ugare, Tarun Suresh, Debangshu Banarjee, Gagandeep Singh, Sasa Misailovic
  In submission
- **Toward Continuous Verification of DNNs**
  Shubham Ugare, Debangshu Banarjee, Tarun Suresh, Sasa Misailovic, Gagandeep Singh
  Workshop @ ICML 2023
- **Incremental Verification of Neural Networks**
  Shubham Ugare, Debangshu Banarjee, 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

Service

Organizer: NNV workshop @ ICML 2023

Reviewer: TMLR 2023