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 ML.

Education

- **University of Illinois at Urbana-Champaign**   IL, USA
  PhD   *2020 -*
    - Computer Science (Adviser: Prof. Sasa Misailovic, Prof. Gagandeep Singh)

- **Indian Institute of Technology, Guwahati**   Guwahati, India
  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

- **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
  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, <u>Shubham Ugare</u>
Workshop @ NeurIPS 2020

- **Approximate Query Processing over Static Sets and Sliding Windows***
Ran Ben Basat, Seungbum Jo, Srinivasa Rao Satti, <u>Shubham Ugare</u>
ISAAC 2018 and TCS 2021

(* marked author names are alphabetically sorted)

Work experience

- **Uber**   San Francisco, USA
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 statically

- **Microsoft Research**   Bangalore, India
Research Software Engineer   *Oct 2019 - Jul 2020*
    - Worked on SeeDot *compiler* that performs fixed-point compilation of ML models

- **Uber**   Bangalore, India
Software Engineer   *July 2018 - Oct 2019*
    - Worked on Uber Lite, Uber bus applications
    - Worked on NullAway *static program analysis* tool to statically find JAVA NPEs.

- **Max Plank Institute of Software Systems**   Kaiserslautern, Germany
Research fellow   *Summer 18'*
    - Worked on using *machine learning* techniques for invariant synthesis

- **Seoul National University**   Seoul, South Korea
Research Intern   *Summer 17'*
    - Worked on finding succinct data structures to solve query processing problems

Achievements

1. Competitive Programming competitions

    - **ACM ICPC**: Ranked **5th** and **7th** in *ACM ICPC Asia Regionals* at Kharagpur and Chennai respectively
    - **Goldman Sachs Quantify**: **1st** rank with 3500+ participants
    - **Codenation 2017**: **4th** rank in the contests with 8000+ participants

2. Pre-university exams

    - **Mathematics Olympiad 2013 and 2014**: Qualified for the Indian National Mathematics Olympiad (INMO 2013) by securing **13th** rank and for INMO 2014 by securing **6th** rank in state
    - **JEE 2014**: Ranked in top 0.1% students in 1.3 million candidates appearing for the test