

# Shaurya Gomber

## Education

- 2024–Present **Ph.D. in Computer Science**, *University of Illinois Urbana-Champaign*, USA  
GPA: 4.0/4.0; Advisor: [Prof. Gagandeep Singh](#)
- 2022–2024 **M.S. in Computer Science**, *University of Illinois Urbana-Champaign*, USA  
GPA: 4.0/4.0; Advisor: [Prof. Gagandeep Singh](#)
- 2016–2020 **B.Tech. in Computer Science**, *Indian Institute of Technology Guwahati*, India  
GPA: 9.66/10.0 (Institute Rank 3)

## Research Interest

My current research focuses on developing efficient and precise techniques for program analysis by leveraging the synergy between learning-based and symbolic methods. I'm also interested in automated reasoning tools (e.g., SAT/SMT solvers), and the analysis of neuro-symbolic systems.

## Publications

### Drafts & Preprints

**Efficient Ranking Function-Based Termination Analysis with Bi-Directional Feedback**  
Yasmin Sarita, Avaljot Singh, [Shaurya Gomber](#), Mahesh Viswanathan, Gagandeep Singh  
[Arxiv](#)

### Workshops & Posters

- VerifAI ICLR'25 **Neural Abstract Interpretation**  
SRC PLDI'24 Shaurya Gomber, Gagandeep Singh  
[Paper](#) | [Poster](#)

### Thesis

- MS CS UIUC **Neural Abstract Interpretation: Leveraging neural networks for automated, efficient and differentiable abstract interpretation**  
Shaurya Gomber  
🏆 **David J. Kuck Outstanding MS Thesis Award**  
[Thesis Link](#)

## Work Experience

- Summer 2023 **Applied Scientist Intern**, *Automated Reasoning Group @ Amazon Web Services*, Santa Clara, CA, USA
- Worked on [Zelkova](#), a tool for reasoning about AWS access policies via SMT-based verification.
  - Used [SMT0 \(SMT with Oracles\)](#) to design efficient SMT encodings for hard-to-model *type-casting semantics*, such as numeric comparisons over strings (e.g., allowing access if a string-valued attribute is less than 42).
  - Our technique solved  $\sim 30k$  previously-unsolved production queries, with average solving time of  $\sim 1$  minute per query.
  - Contributed to [CVC5's SMT0 solver](#) by fixing bugs and improving the I/O interface for oracles.
  - Tech Stack: Java, Scala, Python, SMT Solvers (Z3, CVC5, etc.)

2020-2022 **Senior Member of Technical Staff, D.E. Shaw & Co.,** Hyderabad, India

- Enhanced the firm's low-latency trading system (processing terabytes of data daily) with on-demand data computation features to optimize trader workflows.
- Reviewed major projects, contributed to design discussions for core trading system components, and mentored two new SDE-1s.
- Tech Stack: Java & C++ (backend), React (frontend), Git, Bash, Grafana, Numpy, Matplotlib.

Summer 2019 **Software Engineering Intern, D.E. Shaw & Co.,** Hyderabad, India

Implemented a *type-safe low-latency API* in Java to read and write on the firm's database, achieving a 60x run-time improvement in production-critical scripts, leading to a Pre-Placement Offer.

## Teaching Experience

Fall '23 Teaching Assistant, CS421 Programming Languages & Compilers, UIUC

Spring '23 Teaching Assistant, CS421 Programming Languages & Compilers, UIUC

Fall '22 Teaching Assistant, CS225 Data Structures & Algorithms, UIUC

## Talks

Apr 2024 **Neural Abstract Interpretation**

Formal Methods Seminar, Spring 2024, UIUC

[Slides](#)

Nov 2023 **Verification and Certified Training of PINNs**

CS598 Scientific Machine Learning, Fall 2023, UIUC

[Slides](#)

Nov 2023 **Satisfiability and Synthesis Modulo Oracles**

Formal Methods Seminar, Fall 2023, UIUC

[Slides](#)

May 2023 **Neural Approximations of Abstract Transformers**

CS477 Formal Software Development Methods, Spring 2023, UIUC

[Slides](#)

Mar 2023 **Synthesizing Abstract Transformers**

Formal Methods Seminar, Spring 2023, UIUC

[Slides](#)

Nov 2022 **Monotonic Neural Networks**

CS521 Trustworthy AI Systems, Fall 2022, UIUC

[Slides](#)

## Awards & Fellowships

2024-25 **David J. Kuck Outstanding Master's Thesis Award**

[Link](#)

2024-25 **Richard T. Cheng Endowed Fellowship**

[Link](#)

2018-19 **Institute Merit Scholarship IIT Guwahati**

## Academic Service

Artifact  
Evaluation  
Committee

PLDI '25, PLDI '24

## Mentorship

- **Mentored CSE freshers** under the Mentor-Mentee program of the **SAATHI Counselling Club** of IIT Guwahati.
- **Placement Lectures Coordinator, IITG:** Organized the lectures (content, schedule etc.) and taught Data Structures & Algorithms to the candidates appearing for placements.
- **Treasurer, CSEA (2019-20):** Served as the treasurer of the Computer Science and Engineering Association, IIT Guwahati, and was responsible for the fund management and allocation for the CSEA events.

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## Selected Distinctions

- **Microsoft Code.Fun.Do 2019:** National finalist (top 10 out of 300+ teams); project on Blockchain-based Voting System.
- **Inter IIT Tech Meet 2018:** Represented IIT Guwahati in the coding hackathon event held at IIT Bombay.
- **ACM ICPC 2018:** Qualified for India regionals; represented IITG at Amritapuri, Kerala.
- **KVPY 2015:** AIR 178 among 1.5 million candidates (top 0.01%) in the national science aptitude exam by IISc Bangalore.
- **IIT JEE Advanced 2016:** AIR 902 among 1.5 million candidates (top 0.06%) in the final phase of India's premier engineering entrance exam.
- **IIT JEE Mains 2016:** AIR 2323 among 1.5 million candidates (top 0.15%) in India's engineering entrance prelims.