

AFFILIATION	Assistant Professor Chandruka New Faculty Fellow Indian Institute of Technology Delhi
RESEARCH INTERESTS	My research area is automated reasoning and formal methods and their usage in designing, building, and verifying scalable systems with rigorous guarantees. Specifically, my research is directed at functional synthesis and constrained sampling.
EDUCATION	Indian Institute of Technology (IIT) Kanpur, India & National University of Singapore (NUS), Singapore (Aug '23) <i>Doctorate of Philosophy (Ph.D.) in Computer Science</i> Ph.D. Advisors: Prof. Kuldeep S. Meel and Prof. Subhajit Roy
PUBLICATIONS	CURRENTLY UNDER SUBMISSION : Underlined names: my research group members and me. <ul style="list-style-type: none">• LLM-In-The-Loop Weakest Precondition Synthesis with Counterexample-Guided Refinement. <u>Kushagra Gupta</u>, Sumanth Prabhu S, <u>Priyanka Golia</u>, Kumar Madhukar In submission.• Explaining Rankings with Hidden Group Bonuses Yan Hong Yao Alvin, Sujoy Bhore, Suraj Shetiya, <u>Priyanka Golia</u>, Diptarka Chakraborty In submission.• Provable Guarantees in Approximate Circuit Synthesis <u>Kushagra Gupta</u>, <u>Priyanka Golia</u>, Subhajit Roy and Kuldeep S. Meel. In submission. PUBLISHED CONFERENCE PAPERS: <ul style="list-style-type: none">• Synthesis with Explicit Dependencies <u>Priyanka Golia</u>, Subhajit Roy, Kuldeep S. Meel In Proc. of Design, Automation and Test in Europe (DATE), 2023 Best Paper Award Nomination.• A Scalable Shannon Entropy Estimator <u>Priyanka Golia</u>, Brendan Juba, Kuldeep S. Meel In Proc. of International Conference on Computer Aided Verification (CAV), 2022. Invited to Appear in Formal Methods in System Design (FMSD), 2025• On Quantitative Testing of Samplers Mate Soos, <u>Priyanka Golia</u>, Sourav Chakraborty, Kuldeep S. Meel In Proc. of International Conference on Principles and Practice of Constraint Programming (CP), 2022.• Engineering an Efficient Boolean Functional Synthesis Engine <u>Priyanka Golia</u>, Friedrich Slivovsky, Subhajit Roy, Kuldeep S. Meel In Proc. of International Conference On Computer Aided Design (ICCAD), 2021 Best Paper Award Nomination (6 out of 121 papers).• Program Synthesis as Dependency Quantified Formula Modulo Theory <u>Priyanka Golia</u>, Subhajit Roy and Kuldeep S. Meel In Proc. of International Joint Conference on Artificial Intelligence (IJCAI), 2021.• Designing Samplers is Easy: The Boon of Testers <u>Priyanka Golia</u>, Mate Soos, Sourav Chakraborty, Kuldeep S. Meel In Proc. of Formal Methods in Computer-Aided Design (FMCAD), 2021.• Manthan: A Data-Driven Approach for Boolean Functional Synthesis <u>Priyanka Golia</u>, Subhajit Roy and Kuldeep S. Meel In Proc. of International Conference on Computer Aided Verification (CAV), 2020.

Selected Referred Workshop Papers and Posters:

- Designing Sampler and Tester in Tandem.
Priyanka Golia, Mate Soos,, Sourav Chakraborty, Kuldeep S. Meel
International Conference on Software Engineering (ICSE), 2021, Poster track.
- A Data-driven Approach for Functional Synthesis.
Priyanka Golia, Kuldeep S. Meel, Subhajit Roy.
32nd European Summer School in Logic, Language and Information (ESSLI), 2020.

AWARDS AND HONORS

- Anusandhan National Research Foundation's **early career research grant** of 60 Lakh INR.
- [ACM India doctoral disseration award](#) 2024 including a prize money of 2 Lakh INR.
- Manas Mandal Best Ph.D. dissertation award at IITK including a prize money of 50K INR.
- Invited to be Young Researcher participant at 10th Heidelberg Laureate Forum, 2023.
- EECS **Rising Star**, 2022.
- Invited participant at **Simons Institute** for Satisfiability: Theory, Practice, and Beyond, Spring 2021.

PROFESSIONAL SERVICE

- Program Committee: ATVA 2025 (AE-Chair), SAT 2025, IJCAI 2024, ECAI 2024, CP 2024, NeurIPS 2023 Workshop GenPlan, CP Doctoral symposium 2022.
- Conference Reviewer: CAV 2022, CP 2022, FMCAD 2022, ISEC 2022, HiPC 2020, ISEC 2019 (PhD symposium).

OUTREACH ACTIVITIES

- Co-Organizing [IndiCS workshop on Automated Synthesis](#).
- Workshop on [Model Counting, Sampling, and Synthesis](#), co-located with conference SAT 2025 and CP 2025.
- [Winter School on Formal Verification and Program Synthesis](#), CSE IITD.
- 9th Edition of [Indian SAT-SMT School](#), co-located with SAT 2024.
- [Workshop on Model Counting, Sampling, and Synthesis](#), co-located with SAT 2024.

TEACHING

- COL876: Spl. Topics in formal methods (Focused in SAT+SMT solvers).
- COL750: Foundations of Automatic Verification.
- COL1000: Intro to Programming.

TUTORIAL

[Automated Synthesis: Towards the Holy Grail of AI.](#)

Co-presenters: S. Akshay, Supratik Chakraborty, Kuldeep S. Meel and Subhajit Roy.

1. Presented in AAAI conference on Artificial Intelligence (AAAI), 2022.
2. Presented in International Joint Conference in Artificial Intelligence (IJCAI), 2022.

SELECTED TALKS

- Invited to give an early career researcher talk at the Academic Research and Careers for Students (ARCS)-ACM India event.
- Invited to be a Keynote Speaker at [ICTAC'24](#).
- **Fusing AI and Formal Methods for Automated Synthesis**
[Invited talk CISPA](#), [MPI-SWS](#), [University of Iowa](#), [Emory University](#), [Aalto University](#), [ANU](#), [George Mason University](#).

OPEN SOURCE
TOOLS

1. **Manthan**: A data-driven approach for Boolean functional synthesis.
2. **DeQuS**: SyGuS to DQBF instance converter.
3. **ScalBarbarik**: A a computational hardness based framework tester for uniform sampler.
4. **EntropyEstimator**: A scalable Shannon entropy estimator.
5. **CMSTGen**: A uniform-like sampler.