Priyanka Golia (she/her/hers)

https://priyanka-golia.github.io

AFFILIATION

Assistant Professor

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)*
Doctorate of Philosophy (Ph.D.) in Computer Science

Ph.D. Advisors: **Prof. Kuldeep S. Meel** and **Prof. Subhajit Roy**

Malaviya National Institute of Technology (MNIT) Jaipur, India *(May '17)*
Master of Technology (M.Tech) in Computer Science

Vellore Institute of Technology (VIT) Vellore, India *(May '15)*
Bachelor of Technology (B.Tech) in Computer Science

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.

PUBLICATIONS

1. **Synthesis with Explicit Dependencies**
   Priyanka Golia, Subhajit Roy, Kuldeep S. Meel
   In Proc. of Design, Automation and Test in Europe (DATE), 2023
   Best Paper Award Nomination.
2. **A Scalable Shannon Entropy Estimator**
   Priyanka Golia, 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).
3. **On Quantitative Testing of Samplers**
   Mate Soos, Priyanka Golia, Sourav Chakraborty, Kuldeep S. Meel
   In Proc. of International Conference on Principles and Practice of Constraint Programming (CP), 2022.
4. **Engineering an Efficient Boolean Functional Synthesis Engine**
   Priyanka Golia, 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).
5. **Program Synthesis as Dependency Quantified Formula Modulo Theory**
   Priyanka Golia, Subhajit Roy and Kuldeep S. Meel
   In Proc. of International Joint Conference on Artificial Intelligence (IJCAI), 2021.
6. **Designing Samplers is Easy: The Boon of Testers**
   Priyanka Golia, Mate Soos, Sourav Chakraborty, Kuldeep S. Meel
   In Proc. of Formal Methods in Computer-Aided Design (FMCAD), 2021.
7. **Manthan: A Data-Driven Approach for Boolean Functional Synthesis**
   Priyanka Golia, 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.

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. **CMSGen**: A uniform-like sampler.

Awards and Honors

- Invited to Dagstuhl seminar on Automated Synthesis: Functional, Reactive and Beyond, 2024.
- Young researcher participant at 10th Heidelberg Laureate Forum, 2023.
- EECS **Rising Star**, 2022.
- Student participant at **Simons Institute** for Satisfiability: Theory, Practice, and Beyond, Spring 2021.
- Invited to **Autoboz Research Camp** on Logic, Automata, and Games, Spring 2022. (regretfully decline)

Talks

- **Fusing AI and Formal Methods for Automated Synthesis**
  Invited talk CISPA, MPI-SWS, University of Iowa, Emory University, Aalto University, ANU, George Mason University.
- **Manthan: A Data-Driven Approach for Boolean Functional Synthesis**
  1. International Workshop on Quantified Boolean Formulas and Beyond, SAT, 2022.
  2. CP doctoral symposium, 2022.
  3. Invited student talk at iVerif: Workshop on artificial intelligence and Verification a Pre FSTTCS workshop, 2021.
  4. At Highlights of Logic, Games and Automata, 2021.
  5. FMCAD student symposium, 2021.
  6. 32nd European Summer School in Logic, Language and Information, 2021.
  7. LiVe 2020: 4th Workshop on Learning in Verification, ETPAS, 2020.
  8. NUS research Week, 2020.
  9. Conference talk, CAV, 2020.
- **Program Synthesis as Dependency Quantified Formula Modulo Theory**
  1. Simons Institute reunion for for Satisfiability: Theory, Practice, and Beyond, 2022.
  2. At Highlights of Logic, Games and Automata, 2022
  3. Software Engineering Research in India, SERI, 2021.
  4. International Workshop on Quantified Boolean Formulas and Beyond, SAT, 2021.
  5. Formal Method Update, India, 2021.
  6. Conference talk, IJCAI, 2021.

- **Designing Samplers is Easy: The Boon of Testers**
  1. Workshop on model counting, SAT, 2022.
  2. Conference talk, FMCAD, 2021.
- **Engineering an Efficient Boolean Functional Synthesis Engine**
  1. Conference talk, ICCAD, 2021.
  2. Networking event Munich, ICCAD, 2021.

Teaching Assistant

- Mathematics for Computer Science (UG course), Autumn, 2021-2022, IIT Kanpur.
- Introduction to Artificial Intelligence (UG course), Winter, 2019-2020, 2020-2021, NUS, Singapore.
- Knowledge Complication and Representation (PG course), Autumn, 2019-2020, 2020-2021, NUS, Singapore.
- Parallel Complexity and Sub-Logarithmic Time Algorithms (PG course), Autumn, 2018-2019, IIT Kanpur.
- Parallel Algorithms (PG course), Winter, 2017-2018, IIT kanpur.
- Computer Organisation (UG course), Autumn, 2017-2018, IIT Kanpur.

Professional Service

- Program Committee: IJCAI 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).