

Hong Kong University of Science and Technology, Hong Kong  
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## Education

- 2021 - Present **PhD, Computer Science, HKUST, Hong Kong**  
**Supervisor:** Prof. Amir Goharshady
- 2019 - 2021 **MSc, Computer Science, Chennai Mathematical Institute, Chennai, India**  
**Thesis Title:** On the relation between the classes of Weighted Automata and Linear Cost Register Automata  
**Supervisor:** Prof. Laure Daviaud
- 2016 - 2019 **BSc, Computer Science, Delhi University, New Delhi**

## Internships/Research Visits

- Aug. 2024 - **Applied Science Intern at Amazon Science, Santa Carla, USA**, to work with  
Nov. 2024 Dr. Bruno Dutertre on proofs of correctness of preprocessing in SMT solvers
- Mar. 2024 - **Research Visit at IMDEA, Madrid**, Worked with Prof. Alessio Mansutti on  
July 2024 optimization on integer linear-exponential systems
- June 2023 - **Applied Science Intern at Amazon Science, Santa Carla, USA**, Worked with  
Aug. 2023 Dr. Bruno Dutertre on proofs of unsatisfiability in SMT Solvers
- Feb. 2023 - **Research Visit at TU Wien, Vienna**, Worked with Prof. Laura Kovács on  
May 2023 synthesis of loops with quadratic form as invariants
- July 2021 - **Research Internship at NUS, Singapore**. Worked with Prof. Prateek Saxena on  
Dec. 2021 understanding the privacy/security robustness of neural network models with respect to the membership inference attacks.
- May 2020 - **Research Internship at CMI, Chennai** - Worked with Prof. M. Praveen on  
July 2020 *Defining window expressions that can be used to describe windows on a stream using MSO formula*
- Sep. 2019 - Program Verification and Bug Localization: A tool for verification and bug-localization  
Dec. 2020 of array programs *Link to Github*  
*Under guidance of Prof. Mandayam Srivas, CMI*
- Jan. - Apr. 2019 Developed an independent external open source Learning Tool Interoperability (LTI)  
2019 compatible application for offering quizzes in MOOC Platforms. **(iQuiz)**

## Fellowships

- Sep. 2021 - **Postgraduate Studentship:** During Ph.D. in Computer Science at HKUST, Hong  
Present Kong, HK\$ 216,360 per year
- Aug. 2019 - **Cognizant Foundation Scholarship for Promoting Excellence:** During Mas-  
July 2021 ter's in Computer Science at CMI, Chennai, INR 400,000 in total

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## Awards and Grants

- Oct. 2023 **HKUST Research Travel Grant** to support expenses of attending OOPSLA 2023, HK\$ 11,000
- Oct. 2023 **ACM SIGPLAN PAC** (professional activities grant) to support the expenses of attending OOPSLA 2023, US\$ 1,350
- Nov. 2022 **HKUST Research Travel Grant** to support the expenses of attending CCS 2022, HK\$ 13,500

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## Academic Service

### Artifact Evaluation Committee

- Jan. 2024 International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI) 2024
  - April 2024 Tools and Algorithms for Construction and Analysis of Systems (TACAS) 2024
- ### Student Volunteer
- Oct. 2023 OOPSLA/SPLASH'23, **Lisbon, Portugal**
  - Aug. 2022 FLoC 2022: The 8th Federated Logic Conference, **Technion, Haifa, Israel**
  - Jan. 2021 POPL 2021 (Symposium on Principles of Programming Languages)

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## Teaching Assistantships

- Spring 2025 *Introduction to Combinatorial Optimization* by Prof. Sunil Arya at HKUST
- Fall 2023 *Theory of Computation* by Prof. Nevin L. Zhang at HKUST
- Spring 2023 *Blockchain, Cryptocurrencies and Smart Contracts* by Prof. Amir Goharshady at HKUST
- Spring 2022 *Design and Analysis of Algorithm* by Prof. Dimitris Papadias at HKUST
- Spring 2021 Complexity Theory by Prof. Partha Mukhopadhyay at CMI
- Fall 2020 *STM4DL (Satisfiability Modulo Theory for Deep Learning)* by Prof. Mandayam Srivas at CMI
- Fall 2020 *Theory of Computation* by Prof. Narayan Kumar and Prof. C. Aiswarya at CMI
- Fall 2020 *Introduction to Logic* by Prof. M. Praveen at CMI
- Spring 2020 *Modern Application Development* Online Course by IIT - *Moderating discussion forum, making quizzes, writing lecture notes*

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## Publications

- ESOP'25 Amir Goharshady, S. Hitarth, Sergei Novozhilov, **Efficient Synthesis of Tight CORE: A Polynomial Upper-bounds for Systems of Conditional Polynomial Recurrences**
- ASPLOS'25 Xuran Cai, Amir Goharshady, S. Hitarth, Chun Kit Lam, **Faster Register Allocation via Grammatical Decompositions of Control-Flow Graphs**
- FMCAD S. Hitarth, Cayden Codel, Hanna Lachnitt, Bruno Dutertre, **Extending DRAT to CORE: B SMT** ([doi.org/10.34727/2024/isbn.978-3-85448-065-5-8](https://doi.org/10.34727/2024/isbn.978-3-85448-065-5-8))
- STACS'24 S. Hitarth, G Kenison, L Kovács, A Varonka, **Linear Loop Synthesis for Quadratic CORE: A Invariants** ([doi.org/10.48550/arXiv.2310.05120](https://doi.org/10.48550/arXiv.2310.05120))

OOPSLA'23 Z. Cai, S. Farokhnia, A. Goharshady, S. Hitarth, **Asparagus: Automated  
CORE: A Synthesis of Parametric Gas Upper-bounds for Smart Contracts**  
([doi.org/10.1145/3622829](https://doi.org/10.1145/3622829))

OOPSLA'23 A. Goharshady, S. Hitarth, H. J. Motwani, F. Mohammadi, **Algebro-geometric  
CORE: A Algorithms for Template-based Synthesis of Polynomial Programs, ACM  
SIGPLAN Distinguished Paper Award** ([doi.org/10.1145/3586052](https://doi.org/10.1145/3586052))

CCS'23 T. Baluta, S. Shen, S. Hitarth, S. Tople, P. Saxena, **Membership Inference Attacks  
CORE: A and Generalization: A Causal Perspective** ([doi.org/10.1145/3548606.3560694](https://doi.org/10.1145/3548606.3560694))

2023 M. Praveen and S. Hitarth, **Window Expressions for Stream Data Processing**  
Upcoming ([doi.org/10.48550/arXiv.2209.04244](https://doi.org/10.48550/arXiv.2209.04244))

2021 S. Hitarth, **Study of classes of Cost Register Automata and their relationship  
Master's Thesis to Weighted Automata** ([Drive Link](#))

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## Relevant Courses

**Theoretical Computer Science** Introduction to Combinatorial Optimization, Independent Study course on Parameterized Algorithms, Cryptography and Security, Topics in Algorithm (Matching Theory and Flows), Introduction to Quantum Computation, Timed Automata, Weighted Automata, LAG (Logic, Automata, and Games), Complexity Theory, Theory and application of SMT Solvers, Theory of Computation, Mathematical Logic, Theoretical Foundation of Computer Science

**Other Computer Science** Knowledge Discovery in Databases, Computer Networks, Machine Learning, Advanced Computer Graphics, Parallel Programming, Problem Solving using Computers, Operating Systems, Computer System Architecture, Analysis of Algorithm and Data Structures, Internet Technologies, Database Management System, Programming in Haskell

**Mathematics** Advanced Algebra, Stochastic Processes, Calculus, Real Analysis, Algebra, Probability and Statistics, Discrete Mathematics, Linear Optimization

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## Conference/Summer Schools

October 2024 FMCAD'24, **Prague, Czechia**

March 2024 STACS'24, **Clermont-Ferrand, France**

October 2023 OOPSLA/SPLASH'23, **Lisbon, Portugal**, Served as Student Volunteer

Jan. 2023 IBM Neuro-Symbolic AI Workshop

Dec. 2022 Winter School on Algorithms for Graphs and Games,  
**Indian Institute of Technology, Jodhpur, India**

Sep. 2022 AGATES: Algebraic Geometry with Applications to TENSors and Secants,  
**University of Warsaw & IMPAN, Warsaw, Poland**

Aug. 2022 SAT/SMT/AR/CP Summer School (FLoC 2022), **Technion, Haifa, Israel**

Aug. 2022 FLoC 2022: The 8th Federated Logic Conference, **Technion, Haifa, Israel**

July 2022 The Algorithmic and Enumerative Combinatorics 2022, **TU Wien, Vienna, Austria**  
June 2022 Swedish Summer School in Computer Science, **KTH, Stockholm, Sweden**  
Jan. 2021 POPL 2021 (Symposium on Principles of Programming Languages), Served as Student  
Volunteer  
Sep. 2020 Highlights of Logic, Games, and Automata