

# Ahmed K. Zaher

*PhD Candidate, HKUST*

✉ akazaher@connect.ust.hk  
🌐 <https://ahmedkzaher.com/>  
👤 Google Scholar 📄 DBLP

## Research Interests

Algorithms and Complexity  
Program Analysis

Automata, Logic, and Games  
Compiler Optimization

## Education

- 2023–2027 **Doctor of Philosophy**, *The Hong Kong University of Science and Technology (HKUST)*  
Advisor: Prof. Amir Goharshady
- 2021–2023 **Master of Philosophy**, *The Hong Kong University of Science and Technology (HKUST)*  
Thesis: “*Parameterized Algorithms for Scalable Interprocedural Data-flow Analysis*”  
Advisor: Prof. Amir Goharshady
- 2021 **Bachelor of Science**, *Tanta University*

## Research Visits

- April–June 2025 **Aarhus University**  
Hosted by Prof. Andreas Pavlogiannis.

## Grants, Honors, and Awards

- 2023–2027 **Hong Kong PhD Fellowship**, HK\$1,353,600  
Awarded by the Research Grants Council of Hong Kong for the first three years, with the fourth year funded by HKUST.
- 2023 **HKUST RedBird PhD Award**, HK\$40,000
- 2023 **HKUST Research Travel Grant** (×2), HK\$13,500 + HK\$11,000
- 2023 **ACM SIGPLAN PAC Funding**, US\$1,850
- 2021–2023 **HKUST Postgraduate Studentship**, HK\$432,720

## Refereed Conference Publications

*In computer science, conferences are the primary venues for peer-reviewed publication. Moreover, in theoretical computer science, author names are ordered alphabetically. The CORE (Computing Research and Education Association of Australasia) and CCF (China Computer Federation) conference rankings are provided; their respective highest ratings are A\* and A. Conferences with these ratings are highly selective and are considered flagship venues in their fields. I was a main contributor to all the works below.*

- [OOPSLA'26] **A New Approach to Optimal Function Inlining for Code Size Minimization via E-Graphs**  
CORE A; CCF A  
A.K. Goharshady, C.K. Lam, A. Pavlogiannis, A.K. Zaher  
*ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications*
- [PLDI'26] **Parameterized Algorithms and Complexity for Function Merging with Branch Reordering**  
CORE A\*; CCF A  
A.K. Goharshady, K. Kochev, T. Shu, A.K. Zaher  
*ACM Conference on Programming Language Design and Implementation*

- [OOPSLA'23] **Exploiting the Sparseness of Control-Flow and Call Graphs for Efficient and On-Demand Algebraic Program Analysis**  
 CORE A; CCF A G.K. Conrado, A.K. Goharshady, K. Kochekov, Y.C. Tsai, A.K. Zaher  
*ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications*
- [VMCAI'23] **Efficient Interprocedural Data-Flow Analysis Using Treedepth and Treewidth**  
 CORE B; CCF B A.K. Goharshady, A.K. Zaher  
*International Conference on Verification, Model Checking, and Abstract Interpretation*

## Manuscripts

- [M1] **A Linear-Time Parameterized Algorithm for Optimal Register Allocation with Copy Coalescing**  
*Under review* A.K. Goharshady, T. Shu, A.K. Zaher
- [M2] **Fine-Grained Complexity of Path Expressions**  
*Under review* A.K. Zaher
- [M3] **Tight Parameterized Bounds for Pushdown and Recursive Games with Reachability Objectives**  
*Under review* A.K. Zaher

## Teaching Assistantships

- Spring 2026 **Honors Design and Analysis of Algorithms, HKUST**
- Fall 2025 **Discrete Mathematical Tools for Computer Science, HKUST**
- Spring 2024 **Discrete Mathematical Tools for Computer Science, HKUST**
- Summer 2023 **Formal Reasoning about Programs, HKUST**
- Fall 2022 **Introduction to Advanced Algorithmic Techniques, HKUST**

## Presentations and Invited Talks

- June 2026 **Parameterized Algorithms and Complexity for Function Merging with Branch Reordering, Oral Presentation, PLDI'26**
- May 2025 **Parameterized Algorithms for Register Allocation with Copy Coalescing, Invited Talk, Aarhus University**
- October 2023 **Exploiting the Sparseness of Control-Flow and Call Graphs for Efficient and On-Demand Algebraic Program Analysis, Oral Presentation, OOPSLA'23**
- January 2023 **Efficient Interprocedural Data-Flow Analysis Using Treedepth and Treewidth, Oral Presentation, VMCAI'23**

## References

**Prof. Amir Goharshady**  
 Gran Sasso Science Institute  
 ✉ amir.goharshady@gssi.it  
 University of Oxford  
 ✉ amir.goharshady@cs.ox.ac.uk

**Prof. Andreas Pavlogiannis**  
 Aarhus University  
 ✉ pavlogiannis@cs.au.dk

**Prof. Sunil Arya**  
 HKUST  
 ✉ arya@cse.ust.hk