

Ahmed K. Zaher

PhD Candidate, HKUST

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👤 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 **Aarhus University**
2025 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. Kochev, 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

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