Haozhe Zhang

Postdoctoral Researcher · University of Zurich
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Education

University of Oxford
DPhil (PhD) in Computer Science *Sep 2017 - Jan 2023*

- Supervisor: Prof. Dan Olteanu
- Research interests: Database Theory, Incremental View Maintenance
- Thesis: *Fully Dynamic Evaluation for Conjunctive Queries with Free Access Patterns*

MSc in Computer Science (Distinction) *Sep 2016 - Sep 2017*

- Thesis: *A State Machine System for Insider Threat Detection*

University of Nottingham
BSc in Computer Science (First-Class Honours) *Sep 2013 - Jul 2016*

- Thesis: *Image Classification using Convolutional Neural Networks*
- Awarded scholarships for academic performance: top 10% (2013), top 20% (2014), and top-10 ranking (2015)

Research Experience

Postdoctoral Researcher, University of Zurich *Feb 2023 - Present*

- Cardinality estimation based on Lp-norms of degree sequences
  - Research resulted in publication in SIGMOD 2025 (Best Paper Award)
  - Follow-up work implementing the algorithm in open-source database systems (e.g., DuckDB, PostgreSQL)
- Investigated worst-case optimality of maintenance for queries under updates to the input database
  - Research resulted in publication in ICDT 2025 and VLDB Journal 2024
- (Co-)Supervised five MSc theses on incremental view maintenance and query optimization

PhD Student, University of Oxford *Sep 2017 - Jan 2023*

- Adaptive Query Evaluation for Conjunctive Queries based on Degree Information
  - Explored trade-offs between preprocessing time, update time and enumeration delay in static and dynamic evaluation
  - Research resulted in the multiple publications in top database venues (SIGMOD, PODS, TODS, LMCS, etc.)

Publications

(* indicates alphabetical order of authors)

Conjunctive Queries with Free Access Patterns Under Updates *2025*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
LMCS Journal 2025

LpBound: Pessimistic Cardinality Estimation Using Lp-Norms of Degree Sequences *2025*
Haozhe Zhang, Christoph Mayer, Mahmoud Abo Khamis, Dan Olteanu, Dan Suciu
SIGMOD 2025. **Best Paper Award**

LpBound in Action: Cardinality Estimation with One-Sided Guarantees *2025*
Christoph Mayer, Haozhe Zhang, Mahmoud Abo Khamis, Dan Olteanu, Dan Suciu
SIGMOD 2025. Demo Paper

Tractable Conjunctive Queries over Static and Dynamic Relations *2025*
* Ahmet Kara, Zheng Luo, Milos Nikolic, Dan Olteanu, Haozhe Zhang
ICDT 2025

F-IVM: Analytics over Relational Databases under Updates *2024*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
VLDB Journal 2024. Special issue on Machine Learning and Databases

Conjunctive Queries with Free Access Patterns Under Updates *2023*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
ICDT 2023

Trade-offs in Static and Dynamic Evaluation of Hierarchical Queries *2023*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
LMCS Journal 2023

Evaluation Trade-Offs for Acyclic Conjunctive Queries *2023*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
CSL 2023

Machine learning over static and dynamic relational data *2021*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
DEBS 2021

F-IVM: Learning over Fast Evolving Relational Data (Demo) *2020*
Milos Nikolic, Haozhe Zhang, Ahmet Kara, Dan Olteanu
SIGMOD 2020. Demo Paper

Trade-offs in Static and Dynamic Evaluation of Hierarchical Queries *2020*
* Ahmet Kara, Milos Nikolic, Dan Olteanu, Haozhe Zhang
PODS 2020

Maintaining Triangle Queries under Updates *2020*
* Ahmet Kara, Hung Q. Ngo, Milos Nikolic, Dan Olteanu, Haozhe Zhang
TODS Journal 2020. Special issue of best papers at ICDT 2019

Counting Triangles under Updates in Worst-Case Optimal Time *2019*
* Ahmet Kara, Hung Q. Ngo, Milos Nikolic, Dan Olteanu, Haozhe Zhang
ICDT 2019. **Best paper award**

Counting Triangles under Updates *2018*
* Ahmet Kara, Hung Q. Ngo, Milos Nikolic, Dan Olteanu, Haozhe Zhang
AMW 2018. Workshop Paper

A State Machine System for Insider Threat Detection *2018*
Haozhe Zhang, Ioannis Agrafiotis, Arnau Erola, Sadie Creese, Michael Goldsmith
GraMSec 2018. Workshop Paper

TALKS

LpBound: Pessimistic Cardinality Estimation Using Lp-Norms of Degree Sequences *2025*
SIGMOD 2025, Berlin, Germany

Recent Advances in Incremental View Maintenance *2024*
Sparse Workshop at PLDI 2024, Copenhagen, Denmark

Tractable Conjunctive Queries over Static and Dynamic Relations *2023*
ICDT 2023, Ioannina, Greece

Trade-offs in Static and Dynamic Evaluation of Hierarchical Queries *2020*
PODS 2020, Virtual Conference

Counting Triangles under Updates in Worst-Case Optimal Time *2019*
ICDT 2019, Lisbon, Portugal

A State Machine System for Insider Threat Detection *2018*
GraMSec 2018, Oxford, UK

SERVICE

- PC Member for ICDE 2026 *2026*
- PC Member for SIGMOD 2025 *2025*
- Reviewer for ACM Transaction on Database Systems (TODS) *2023, 2024*
- Reviewer for Logical Methods in Computer Science (LMCS) *2022, 2024*

SUPERVISON

I was fortunate to supervise the following MSc thesis:

Yizhi Zhang	Implement Factorized Incremental View Maintenance (F-IVM) on top of Flink	2025
Zheng Luo	Tractable Conjunctive Queries over Dynamic and Static Relations	2024
Neng Xu	Efficient Query Maintenance using Maximal Hierarchical Subqueries	2024
Rui Zhou	MFlow: Incremental View Maintenance of Multiple Queries Workloads Under Updates	2023
Johann Schwabe	CaVieR: CAscading VIEw tRees	2023

TEACHING

Lecturer

- Foundations of Data Science, MSc in Informatics, University of Zurich *Fall 2024*
  - Graduate course with 240 students
  - Delivered lectures, class sessions, lab sessions, and prepared exams
  - Coordinated tutors for student support, exam grading, and exercise assessment

Teaching Assistant

- Foundations of Data Science, MSc in Informatics, University of Zurich *Fall 2020 - Fall 2023*
- Efficient Algorithms, MSc in Informatics, University of Zurich *Spring 2021 - Spring 2025*
- Modern Data Analytics (seminar), MSc in Informatics, University of Zurich *Fall 2023*
- Database System Implementation, MSc in Informatics, University of Oxford *Hilary 2019*

Professional Experience

HungryPanda Ltd, London, UK
Software Developer *Jan 2017 - Jul 2018*

- Designed and implemented an internal delivery management system using Vue.js (frontend) and Node.js/MySQL (backend) for order tracking and fleet management. It allows the customer service team to monitor delivery status in real-time and handle delivery exceptions efficiently, such as reassigning orders to different drivers or updating delivery priorities.
- Developed a sophisticated route optimization algorithm by working closely with the operations team. The algorithm generates optimal delivery routes by incorporating geographical constraints (e.g., river crossings) and multiple parameters (pickup/dropoff locations, order timing) to minimize customer waiting times. The algorithm is integrated into the delivery management system and has improved delivery efficiency.

IBM, Ningbo, China
Software Engineer Summer Intern *Jun 2014 - Sep 2014*

- Developed a software tool to automate the globalization verification testing process using Java and MySQL.