Chao Zhang

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Experience

- **University of Waterloo** — Waterloo, Canada
  Postdoctoral researcher. Supervisor: M. Tamer Özsu. — *Sept. 2022 - Aug. 2024*
- **Claude Bernard University Lyon 1** — Lyon, France
  Postdoctoral researcher. Supervisor: Angela Bonifati. — *Jan. 2021 - Aug. 2022*
- **French National Centre for Scientific Research** — Clermont Ferrand, France
  Postdoctoral researcher. Supervisor: Farouk Toumani — *Feb. 2020 - Dec.2020*

Education

- **University of Clermont Auvergne** — Clermont Ferrand, France
  Ph.D., Computer Science. Advisor: Farouk Toumani — *Nov. 2015 – Nov. 2019*
- **Harbin Institute of Technology & ISIMA** — Harbin, China & Clermont Ferrand, France
  M.Sc., Software Engineering — *Sept. 2013 – Sept. 2015*
- **Shenyang University of Technology** — Shenyang, China
  B.Sc., Telecommunication Engineering — *Sept. 2009 – July. 2013*

Research areas

Data Management: Graph Data Management; Index methods; Query Processing and Optimization; Stream Processing.

Research Projects

- *Incremental Sliding Window Connectivity over Streaming Graphs*
  Designing an index tailored for connectivity query processing in sliding windows for streaming graphs. The index's primary objective is to efficiently update and process queries amid the continuous insertion and removal of streaming edges within these sliding windows.
- *A Reachability Index for Recursive Label-Concatenated Graph Queries*
  Designing an efficient index for handling reachability queries with recursive label-concatenated path constraints on edge-labeled graphs. The focus is on creating a data structure capable of succinctly storing reachability information with path constraints and speeding up query processing significantly.
- *Efficient Incremental Computation of Aggregations over Sliding Windows*
  Designing an algorithm for computing aggregations within sliding windows over streaming data. Existing algorithms tend to prioritize either high-throughput or low-latency computation. The objective is to develop an incremental and parallel algorithm capable of achieving both high throughput and low latency.
- *Sharing Computations for User-Defined Aggregate Functions*
  Designing a declarative UDAF framework for user-friendly implementation and enhanced understanding within SQL query engines. This involves establishing sharing conditions among various UDAF computations and integrating them with aggregate query rewriting techniques.

Publications

- **Chao Zhang**, Angela Bonifati, and M. Tamer Özsu. An Overview of Reachability Indexes on Graphs. In *Companion of ACM SIGMOD Int. Conf. on Management of Data*, pages 61-68, 2023.

- **Chao Zhang**, Angela Bonifati, Hugo Kapp, Vlad Ioan Haprian, and Jean-Pierre Lozi. A Reachability Index for Recursive Label-Concatenated Graph Queries. In *Proc. 39th Int. Conf. on Data Engineering*, pages 67-81, 2023.
- **Chao Zhang**, Reza Akbarinia, and Farouk Toumani. Efficient Incremental Computation of Aggregations over Sliding Windows. In *Proc. 27th ACM SIGKDD Int. Conf. on Knowledge Discovery and Data Mining*, pages 2136-2144, 2021.
- **Chao Zhang**, Farouk Toumani and Bastien Doreau. SUDAF: Sharing User-Defined Aggregate Functions. In *Proc. 36th Int. Conf. on Data Engineering*, pages 1750-1753, 2020.
- **Chao Zhang** and Farouk Toumani. Sharing Computations for User-Defined Aggregate Functions. In *Proc. 23rd Int. Conf. on Extending Database Technology*, pages 241-252, 2020.
- **Chao Zhang**. Symmetric and Asymmetric Aggregate Functions in Massively Parallel Computing. In *Proc. of the VLDB 2017 PhD Workshop*, pages 53-56, 2017.

Preprints and Submissions

- **Chao Zhang**, Angela Bonifati, and M. Tamer Özsu. Incremental Sliding Window Connectivity over Streaming Graphs. Under submission
- **Chao Zhang**, Angela Bonifati, and M. Tamer Özsu. Indexing Techniques for Graph Reachability Queries. Under review.
- **Chao Zhang** and Farouk Toumani. Sharing Queries with Nonequivalent User-Defined Aggregate Functions. Under review.
- **Chao Zhang**, Reza Akbarinia and Farouk Toumani. Parallelization of Incremental Aggregations over Sliding Windows. Under review.

Research Activities

- Program Committee: SIGMOD 2025 - International Conference on Management of Data, Berlin, Germany, 2025.
- Program Committee: SIGMOD 2024 - International Conference on Management of Data, Santiago, Chile, June 9-15, 2024.
- Program Committee: VLDB 2024 - 50th International Conference on Very Large Data Bases, Guangzhou, China, August 25-29, 2024.
- Program Committee: SoCC 2023 - 14th ACM Symposium on Cloud Computing, Santa Cruz, USA, October 30 - November 1, 2024.
- Program Committee: VLDB 2023 - 49th International Conference on Very Large Data Bases, Vancouver, Canada, August 28 - September 1, 2023.
- Program Committee: SIGMOD 2022 - International Conference on Management of Data, Philadelphia, PA, USA, June 12-17, 2022.
- Invited Journal Reviewer: ACM Transactions on Database Systems.
- Invited Journal Reviewer: The International Journal on Very Large Data Bases.
- Invited Journal Reviewer: IEEE Transactions on Knowledge and Data Engineering.

Teaching

- **Instructor**: CS348 Introduction to Database Systems, University of Waterloo, Winter 2023.
- **Instructor**: Big Data Processing - Apache Spark in Action, University of Clermont Auvergne, Spring 2022.
- **Instructor**: Semantic Web (labs), University of Clermont Auvergne, Fall 2021.

Awards

- Best Paper Award in Francophone Community in Data Management (BDA), Paris, France, October 25-28, 2021.
- Best PhD Thesis Runner-up in Francophone Community in Data Management (BDA), Paris, France, October 27-30, 2020.
- Full scholarship in the 1st BigSkyEarth Training School at the German Aerospace Center, Germany, April 4-9, 2016.

Skills

- Programming Languages: SQL, Java/Scala, C++/C, Python.
- Systems: Oracle PGX, Apache Spark, Apache Flink, SQLite, PostgreSQL, MonetDB, SingleStore.
- Languages: English (proficient), French (intermediate), Chinese (mother tongue).

Reference

- Prof. M. Tamer Özsu
  University Professor at the University of Waterloo
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- Prof. Angela Bonifati
  Distinguished Professor at Claude Bernard University Lyon 1
  angela.bonifati@univ-lyon1.fr
- Prof. Farouk Toumani
  Professor at the University of Clermont Auvergne
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