ZHIHAN GUO

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RESEARCH INTERESTS

I mainly worked on database system, with a focus on transaction processing, distributed databases, and cloud-native databases.

EDUCATION

Ph.D. in Computer Science, UW-Madison / 2018.09 – 2023.05 (expected)
advised by Professor Xiangyao Yu, GPA: 3.95/4.00

B.S. (Hons.) in Computer Science, UW-Madison / 2015.09 – 2018.05
GPA: Overall 3.94/4.00; Major 3.96/4.00

AWARDS AND ACKNOWLEDGEMENTS

Microsoft Ph.D. Fellowship (US & Canada) / 2021

Dean's List (repeated), UW-Madison / Fall 2015 – Spring 2018

UW-Madison Undergraduate Scholarship for Summer Study, UW-Madison / Summer 2016

First-class Scholarship for Excellent Academic Performance (2013-2014), BLCU / Fall 2014

Excellent Leadership Award, BLCU / Spring 2014

PUBLICATIONS

Cornus: Atomic Commit for Cloud DBMS with Storage Disaggregation
Zhihan Guo, Xinyu Zeng, Kan Wu, Wuh-Chwen Hwang, Ziwei Ren, Xiangyao Yu, Mahesh Balakrishnan, Philip A. Bernstein, **(under submission)**

How Good is My HTAP System?
Non-First Author, **(under revision)**

Releasing Locks as Early as You Can: Reducing Contention of Hotspots by Violating Two-Phase Locking
Zhihan Guo, Kan Wu, Cong Yan, Xiangyao Yu,
SIGMOD 2021

The Storage Hierarchy is Not a Hierarchy: Optimizing Caching on Modern Storage Devices with Orthus
Kan Wu, **Zhihan Guo**, Guanzhou Hu, Kaiwei Tu, Ramnatthan Alagappan, Rathijit Sen, Kwanghyun Park, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau,
FAST 2021

A Statistical Perspective on Discovering Functional Dependencies in Noisy Data
Yunjia Zhang, **Zhihan Guo**, Theodoros Rekatsinas,
SIGMOD 2020

Unsupervised Functional Dependency Discovery for Data Preparation
Zhihan Guo, Theodoros Rekatsinas,
ICLR, LLD Workshop 2019

WORKING EXPERIENCE

Affiliate Research Assistant at Microsoft Gray System Lab, Madison / Fall 2021

Software Engineer Intern at Facebook, Delos Team, Madison / Summer 2021
supervised by Dr. David Geraghty, directed by Dr. Mahesh Balakrishnan

Built trace collection and analysis pipeline; Characterized the workload in various use cases; Explored the design implications for Delos based on the analysis across three layers in Delos – key-value interface, local storage (RocksDB), the shared log layer (state machine replication).

RESEARCH EXPERIENCE

UW Madison Database Group / 2018.02-Present

A Survey on Hotspot Techniques in Concurrency Control [ongoing]
advised by Prof. Xiangyao Yu, Dr. Philip Bernstein (@MSR)
Examined the techniques in concurrency control that address the issues of hotspots and developing microbenchmarks to evaluate key characteristics of the techniques.

Improve Two-Phase Commit on Existing Shared Storage
advised by Prof. Xiangyao Yu, Dr. Philip Bernstein (@MSR)
Addressed the blocking issue and reduced one logging in two-phase commit by leveraging the key features provided by storage disaggregation architecture.

Improving Two-Phase Locking to Reduce Contention with Hotspots
advised by Prof. Xiangyao Yu
Proposed a new concurrency control protocol and three optimization techniques as an extension to 2PL to increase concurrency when hotspots are present.

Learning Functional Dependencies over Noisy Data via Sparse Regression
advised by Prof. Theodoros Rekatsinas
Proposed a FD discovery approach over noisy data by casting the problem as structure learning over probabilistic graphical model and solving it through sparse regression.

Wisconsin Human-Computer Interaction Laboratory / 2017.02 – 2018.05

Robots Providing Emotional Support (Senior Honors Thesis)
advised by Prof. Bilge Mutlu
Used a programmable robot to study if non-humanoid robot with non-language vocalization can act as a listener in social sharing process to reduce negative effects.

Child Emotion Lab / 2016.01 – 2017.09

Facial Cues for Emotion Recognition
supervised by Brian Letizke, directed by Prof. Seth Pollak
Communicated with parents and children from local community; Conducted psychological experiments and collected physiological data.

TEACHING EXPERIENCE

Teaching Assistant for Database Management Systems, UW-Madison / Fall 2019

supervised by Prof. Goetz Graefe

SKILLS & RELEVANT COURSEWORK

Programming language: C++, C, Python, Java, MATLAB.

Relevant coursework: database, operating system, distributed system, machine learning