YUYUAN KANG

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EDUCATION

University of Wisconsin-Madison	Madison, US
Ph.D. in Computer Science	Aug. 2022 – Present
Tsinghua University	Beijing, China
Master of Engineering, Software Engineering	Sep. 2019 – Jun. 2022

- Advisor: Prof. Jianmin Wang
- Thesis: Research on the Write Amplification of the Log-Structured Merge-Tree in IoTDB

Northeastern University	Shenyang, China
Bachelor of Engineering, Software Engineering	Sep. 2015 – Jun. 2019

PUBLICATIONS

1. Lei Rui, Xiangdong Huang, Shaoxu Song, **Yuyuan Kang**, Chen Wang, Jianmin Wang, "Time Series Representation for Visualization in Apache IoTDB", (SIGMOD 2024, accepted)
2. **Yuyuan Kang**, Xiangdong Huang, Shaoxu Song, Lingzhe Zhang, Jialin Qiao, Chen Wang, Jianmin Wang, and Julian Feinauer. "Separation or Not: On Handing Out-of-Order Time-Series Data in Leveled LSM-Tree." In *International Conference on Data Engineering* (ICDE), pp. 3340-3352. IEEE, 2022.
3. Jialin Qiao, **Yuyuan Kang**, Xiangdong Huang, Lei Rui, Tian Jiang, Jianmin Wang, and S. Yu Philip. "Heterogeneous Replicas for Multi-dimensional Data Management." In *International Conference on Database Systems for Advanced Applications* (DASFAA), pp. 20-36. Springer, Cham, 2020.

RESEARCH EXPERIENCE

University of Wisconsin-Madison	Madison, WI, USA
Independent Study, worked with Prof. Tej Chajed	Aug 2023 – Dec 2023

- Verifying the backward compatibility of Cap'n Proto

Independent Study, worked with Prof. Xiangyao Yu	Sep. 2022 – May 2023

- Designing new deterministic database systems for more functionality and high performance.

Tsinghua University (National Engineering Laboratory for Big Data Software)	Beijing, China
Research Assistant, advised by Prof. Jianmin Wang	Sep. 2018 – Jun. 2022

Apache IoTDB

- *In stand-alone version*: optimized the execution of the query plan in order to reduce the delay by 10 percent; implemented data compression of communication between client and server; designed and implemented the syntax definition and parsing logic of IoTDB SQL based on ANTLR V4.
- *In* distributed *version*: designed two thresholds in order to control the number of logs in memory; implemented the execution of DDL in distributed scenarios which was based on the Raft protocol; designed and implemented the function to automatically register time series when inserting data.
- Committed more than 60 pull requests. Became an Apache Committe; Edited videos and made subtitles for ApacheCon Asia, 2021.

Tsinghua University (National Engineering Laboratory for Big Data Software)	Beijing, China
Software Enginee	Nov. 2020 – May 2021

Design and Implementation of IoTDB-Oriented Writing System

- Requirement engineering, communicated with Tianyuan Technology Co., Ltd., sorted out time series storage requirements and wrote various types of requirement documents.
- Designed several schemas based on IoTDB and recorded meeting minutes; completed schema design document.
- Implemented and delivered the program according to the design, as well as the data migration document, IoTDB deployment document, API replacement document, and performance report.
- Provided technical support and system maintenance, deployed 10 IoTDB instances; managed 170,000 vehicles and 33 million time series; supported a full spectrum of services to the Tianyuan Technology Co., Ltd.

Tsinghua University	Beijing, China
Independent study, advised by Prof. Jianmin Wang	Dec. 2020 – Mar. 2021

Reinforcement Learning for Designing Optimal Self-Similar Curve-Based Index

- Implemented a program that determines the order of the grid in a multi-dimensional space given a basic pattern. The self-similar transformations include symmetry and rotation, so that traditional curves such as the Hilbert-curve and the Z-ordering curve are inside the search space.
- Proposed a cost model to evaluate a given self-similar curve-based index design and query workload.

- Adopted reinforcement learning to optimize the basic pattern of the index so that the cost is minimized, given a target query workload.

Northeastern University (School of Software)   Shenyang, China
Team Leader, Research Assistant, advised by Prof. Tao Ren   Nov. 2016 – May 2018
Immersive and Intelligent Humanoid Robot Control System
- Designed and implemented a gesture control system in order to manipulate the robot actuators with obtained human motion data through Kinect, in an attempt to make the robot imitate human behavior.
- Proposed a method (Apriori + YOLO v3) to predict the possible location of an object when it is not visible, so that the robot can be able to easily find the target object.
- Registered one software copyright (nationwide).

Northeastern University (School of Software)   Shenyang, China
Independent study, advised by Prof. Tao Ren   Jun. 2016 – Jul. 2016
Teaching demonstration system
- Independently implemented a database management system, which supported the operators, including insert, delete, update and select.
- Designed and implemented UI for the database management system.
- The project was put into use at the college.

SELECTED AWARDS AND HONORS

- Graduate with honors, School of Software, Tsinghua University   2022
- 1st Prize Scholarship of the Tsinghua University   2021
- Excellent Graduation Thesis of the Northeastern University   2019
- Graduate with Honor out of the graduates of Liaoning Provincial Institutions of Higher Learning (top 5%) 2019
- Meritorious Winner of the Mathematical Contest in Modeling (COMAP)   2018
- Exceptional Funding of the Nation (China), Top 5%, National Innovation Training Program for College Students   2018
- Exemplary Undergraduate at Shenyang (only 1 in the college of more than 1,600 students)   2018
- 2nd Prize, Nationwide "Innovation has a future" University AI Innovation Grand Competition   2018
- Gold Award, China College Students' Entrepreneurship Competition in Liaoning Province (top 5%)   2018
- 1st Prize, National Competition for Software and Information Technology Professionals in Liaoning   2018
- 2nd Prize Scholarship of the Northeastern University (Academic Merit)   2018
- Honorable Mention of the Mathematical Contest in Modeling (COMAP)   2017
- Outstanding Student Cadres (Pacesetters) of Northeastern University (top 1%)   2017
- 2nd Prize Scholarship of the Northeastern University (Academic Merit)   2017
- Suzhou Industrial Park Scholarship   2017
- 1st Prize Scholarship of the Northeastern University (Academic Merit)   2016
- 2nd Prize, Mathematical Contest in Modeling, Liaoning Province   2016
- National Scholarship (top 1%)   2016

ADDITIONAL EXPERIENCE

Teaching
- *CS300 - PROGRAMMING II*, UW-Madison   Spring 2024
- *CS407 - Foundations of Mobile Systems and Applications*, UW-Madison   Fall 2023
  Designed lab (sensor data processing), designed pre-lab and mid-term quizzes, graded assignments and final projects.
- *Principal of Database*, Tsinghua University   Spring 2021
  Introduced storage and indexing in the database based on HSQL; introduced LSM-Tree structure; graded undergraduates' homework; designed practice tasks.

Skills
- *Programming*: Java, Python, C/C++, SQL, MATLAB, FStar, Coq
- Languages: Chinese (native), English.