

YUYUAN KANG

Department of Computer Sciences, Tsinghua University, P.R. China

☎ 1 (608) 628-7498; ✉ yuyuan@cs.wisc.edu; 🌐 yuyuankang.github.io

EDUCATION

University of Wisconsin-Madison

Ph.D. in Computer Science

Madison, US

Aug. 2022 – Present

- Advisor: Prof. Xiangyao Yu

Tsinghua University

Master of Engineering, Software Engineering

Beijing, China

Sep. 2019 – Jun. 2022

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

Northeastern University

Bachelor of Engineering, Software Engineering

Shenyang, China

Sep. 2015 – Jun. 2019

- Advisor: Prof. Tao Ren

PUBLICATIONS

1. **Yuyuan Kang**, Xiangdong Huang, Shaoxu Song, Lingzhe Zhang, Jialin Qiao, Chen Wang, Jianmin Wang, and Julian Feinauer. “Separation or Not: On Handling Out-of-Order Time-Series Data in Leveled LSM-Tree.” In *International Conference on Data Engineering (ICDE)*, pp. 3340-3352. IEEE, 2022.
2. 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

Tsinghua University (National Engineering Laboratory for Big Data Software)

Graduate Research Assistant for Prof. Jianmin Wang

Beijing, China

Sep. 2018 – Present

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 Committer (Apache User ID: YuyuanKang); Edited videos and made subtitles for ApacheCon Asia, 2021.

Tsinghua-Tianyuan Technology Co., Ltd. Big Data Technology Joint Research Center

Software Engineer

Beijing, China

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 different 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

Independent study under Prof. Jianmin Wang

Beijing, China

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)

Team Leader, Research Assistant for Prof. Tao Ren

Shenyang, China

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)

Independent study under Prof. Tao Ren

Shenyang, China

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

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| • Graduate with honors, School of Software, Tsinghua University | 2022 |
| • 1 st 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 |
| • 2 nd 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 |
| • 1 st Prize, National Competition for Software and Information Technology Professionals in Liaoning | 2018 |
| • 2 nd 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 |
| • 2 nd Prize Scholarship of the Northeastern University (Academic Merit) | 2017 |
| • Suzhou Industrial Park Scholarship | 2017 |
| • 1 st Prize Scholarship of the Northeastern University (Academic Merit) | 2016 |
| • 2 nd Prize, Mathematical Contest in Modeling, Liaoning Province | 2016 |
| • National Scholarship (top 1%) | 2016 |

ADDITIONAL EXPERIENCE**Teaching**

- Teaching Assistant, *Principal of Database*, Tsinghua University 2021
Introduced storage and indexing in the database based on HSQL; introduced LSM-Tree structure; graded undergraduates' homework; designed practice tasks.

Additional Professional and Extracurricular Experiences

- Vice-Chairman, Graduate Student Association of School of Software, Tsinghua University 2020
- Volunteer, The Second “Peace Cup” International Youth Football Invitational Tournament 2016

Interests

- *Chorus*: was part of the World Peace Choral Festival, Vienna, 2013; joined the choir of Northeastern University.
- *Video post-processing*: was involved in making a video to celebrate the 20th anniversary of the School of Software at the Tsinghua University; was also involved in making videos for the student science and technology festival at the Northeastern University.

Skills

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