Zikun Li

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EDUCATION

School of Electronic Engineering and Computer Science, Peking University (PKU) Beijing, China
Bachelor of Science in Computer Science and Technology Sep 2017 - July 2021

- **Thesis:** A Survey of Data Processing Unit (DPU) and A Preliminary Programming Framework Design
- **Awards:** The Third Prize Scholarship (2020); Model Student of Academic Record (2020)

PUBLICATIONS

- Jizhou Li*, **Zikun Li***, Yifei Xu*, Shiqi Jiang, Tong Yang, Bin Cui, Yafei Dai, and Gong Zhang, 2020, "WavingSketch: An Unbiased and Generic Sketch for Finding Top-k Items in Data Streams", KDD '20 (* indicates equal contribution)

- Zheng Zhong*, Shen Yan*, **Zikun Li***, Decheng Tan, Tong Yang, and Bin Cui, 2021, "BurstSketch: Finding Bursts in Data Streams", SIGMOD '21 (* indicates equal contribution)

- Mingkuan Xu, **Zikun Li**, Oded Padon, Sina Lin, Jessica Pointing, Auguste Hirth, Henry Ma, Jens Palsberg, Alex Aiken, Umut A.Acar, and Zhihao Jia, "Quartz: Superoptimization of Quantum Circuits" (Submitted to PLDI 2022)

RESEARCH EXPERIENCES

A Quantum Program Super-Optimizer PA, USA
Research Assistant, Carnegie Mellon University, Advisor: Dr. Zhihao Jia Sep 2021 – Present

- Participated in the design of optimizer for a quantum compiler, focusing on applying optimization rules to quantum circuits
- Implemented the DAG data structure that represents quantum circuits and methods that enable optimizations to be applied
- Added heuristics in applying optimizations, accelerated the process to reach a near-optimal result
- Conducted experiments and reported feedback that help improve multiple parts of our approach

A Sketch-Based Burst Detection Algorithm in High-Speed Data Streams Beijing, China
Research Assistant, Peking University, Advisor: Dr. Tong Yang Mar 2020 – Nov 2020

- Co-designed a fast, accurate and memory-efficient algorithm for real-time detection of bursts in high-speed data streams
- Surveyed related works and conducted experiments to compare our approach with algorithms in related works
- Drafted and submitted a paper to SIGMOD 2021

An Unbiased and Generic Data Structure for Finding Top-K Items in Data Streams Beijing, China
Research Assistant, Peking University, Advisor: Dr. Tong Yang June 2019 - Feb 2020

- Proposed a data structure which provides unbiased and accurate estimation of frequency of items in a data stream
- Implemented different algorithms in C++, built a benchmark platform to efficiently compare our algorithms with those proposed by related works on various settings
- Drafted and submitted a paper to KDD 2020

An Automatic SQL-Based Feature Generator for Machine Learning Model BC, Canada
Research Assistant, Simon Fraser University, Advisor: Dr. Jiannan Wang May 2020 - Sep 2020

- Designed an algorithm that automatically generates SQL expressions which select certain information from data tables as features for the machine learning model
- Adopted the idea of transfer learning and hyper-parameter tuning for ML to enhance our design
- Scrutinized and revised Python lib Optuna code and conducted experiments to compare our approach with the baseline

PROJECT EXPERIENCES

PKU Ranking Beijing, China
Team Leader, Peking University April 2020 – Jun 2021

- Built a metrics-based ranking website which displays professor info, paper citing rate, and research orientation to help students seek research opportunities

- Implemented a web crawler to periodically fetch and parse data
- Designed database schema, devised and developed backend services

An CNN Accelerator on FPGA Beijing, China

Project Owner, Peking University Sep 2019 – Dec 2019

- Implemented an CNN inference accelerator in C++ on an FPGA with Xilinx HLS tools that applied the ping-pong buffer
- Designed the accelerator to achieve batch-dimension parallelism which largely improved the performance

TECHNICAL SKILLS

- Programming languages: C, C++, Java, Python, SQL, JavaScript, Lisp
- Tools: Git, Github, Docker, MySQL, SQLite, SQL Server, Microsoft Office
- Frameworks: Pytorch, Tensorflow, CUDA, Pandas, Flask, React

TEST SCORES

- TOEFL: 107;
- GRE: 333+4.0