ZIYAO YIN

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EDUCATION

Southern University of Science and Technology   Sep 2020 - Present
Shenzhen, China
(Expected) B.E., Department of Computer Science & Engineering
GPA: 3.85/4.0, Rank: 16/221

University of California, Irvine   June 2023 - Sep 2023
Irvine, CA, USA
Visiting student, Department of Electrical Engineering and Computer Science
GPA: 4.0/4.0

PUBLICATION

[C1] **Z. Yin**, Y. Zhang, S. Huang. "HyTrans: An HBM-based End-to-End Transformer Accelerator with Hybrid Dataflow Optimizations" in *The 61th Design Automation Conference* **(DAC'24)** (under review)

[C2] X. Zhi, X. Yan, B. Tang, **Z. Yin**, Y. Zhu, M. Zhou. "CoroGraph: Bridging Cache Efficiency and Work Efficiency for Graph Algorithm Execution." in *Proceedings of the VLDB Endowment* **(VLDB'24)**, Accepted for Publication

RESEARCH EXPERIENCE

CORSA Lab, UC Irvine   May 2023 - Dec 2023
Research Intern, Supervisor: Prof. Sitao Huang   *Irvine, CA, USA*

Research Project: FPGA Transformer Accelerator
● Inspected existing hardware accelerators and analyzed the bottlenecks of different accelerator architectures in transformer operations.
● Implemented a hybrid accelerator design that combines the advantages of two architectures to implement an end-to-end optimal design.
● Designed a suite of efficiency optimizations to maximize the utilization of hardware resources and end-to-end performance.
● Completed the majority of the work, spanning from initial exploration to paper writing, and submitted the paper to DAC 2024 (under review).

Database Group, SUSTech   Sep 2022 - Present
Research Assistant, Supervisor: Prof. Bo Tang, Prof. Xiao Yan   *Shenzhen, China*

Research Project: Corograph, an efficient graph algorithm framework
● Analyzed the performance bottlenecks of existing algorithm frameworks, revealing the conflict between cache efficiency and work efficiency.
● Implemented software level prefetch based on coroutine to optimize CPU cache utilization efficiency.
● Proposed a hybrid execution model that combines the benefits of different executions models in existing graph frameworks.
● This work is submitted to VLDB 2024 and is accepted for publication.

SIGMOD Programming Contest: Approximate K-nearest-neighbor Graph Construction
Construct one approximate K-NN Graph for large-scale dataset, which contains 10 million high-dimensional vectors and the distance between vectors are measured by Euclidean distance. Achieved sixth place on the final list.

TECHNICAL STRENGTHS

| **Programming Languages** | C, C++, Python, Java |
| **Hardware description language** | Verilog, HLS |

SELECTED AWARDS

SUSTech Annual Outstanding Student of 2021	Oct 2021
SUSTech Annual Outstanding Student of 2022	Oct 2022
SUSTech Program Design Competition, third prize	Dec 2021

SERVICE

Teaching Assistant for CS202 Computer Organization	Feb 2023 - Present

SELECTED COURSE PROJECTS

SUSTech Programming Language(SPL) compiler   Sep 2022 - Dec 2022

Course: SUSTech CS323 Compiler
I implemented a compiler front-end and back-end for the SPL programming language (containing basic C syntax) based on C, including semantic analysis, intermediate code generation, machine code generation, and machine-independent optimization of intermediate code. It can compile a program including logic statements, array types, user-defined data types, function calls, and output executable MIPS32 assembly code.

FPGA-based CPU   Feb 2022 - June 2022

Course: SUSTech cs202 Computer Organization
Implement a single cycle CPU via Verilog HDL. It supports the basic MIPS32 instruction set, Uart data transfer interface, and simple interaction. I later became a teaching assistant for the course and helped to improve the project design.

Bustub database management system   Sep 2022 - Dec 2022

Course: CMU 15-445 Database Systems
Learn and implement buffer pool, indexing, concurrency control, and query processing on the Bustub database system for educational purposes through CMU's well-known open-source course resources.

MyGitHub code management platform   Sep 2022 - Dec 2022

Course: SUSTech cs309 Object-Oriented Analysis and Design
Implement a similar GitHub website based on Vue and Spring Boot, including code version control, pull request, and other open-source community features, as well as a beautiful user interface.