Yusen Liu

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EDUCATION

University of Wisconsin-Madison, WI, USA   *09/2023 – Present*
PhD, Computer Science
➢ Overall GPA: 4.0/4.0
➢ Core Courses: SmartNIC systems (A), currently taking: CS564 Intro to Database, CS760 Machine Learning, CS839 Foundation Models

University of California-Davis, CA, USA   *09/2021 – 06/2023*
Master of Science in Computer Science
➢ Overall GPA: 4.0/4.0
➢ Core Courses: Computer Engineering, Operating Systems, Computer Architecture, Modern Parallel Computing, Advanced Algorithms

University of Wisconsin-Madison, WI, USA   *09/2018 – 07/2021*
Bachelor of Science, Computer Science, Mathematics
Graduated with Distinction in Computer Science
➢ Overall GPA: 3.85/4.0
➢ Core Courses: Intro to Operating Systems (A), Intro to Programming Languages and Compiler (A), Intro to Computer Networks (A), Intro to Algorithms (A), Intro to Bioinformatics (A), Applied Cryptography (A), Advanced Topics in DBMS (AB), Intro to AI (AB), Intro to the Theory of Computation (AB)

Wuhan University, Wuhan, China   *09/2015 – 06/2018*
Department of Software Engineering
➢ Overall GPA: 3.4/4.0

RESEARCH EXPERIENCE

Designing an Efficient Interface for Near-Memory Accelerators   *03/2021-Present*
Advisors: Michael Swift, Jason Lowe-Power
Supported by SRC
➢ Implemented a shared-queue PCIe device driver for users enqueuing tasks to the accelerator.
➢ Simulated the accelerator in QEMU for testing the correctness of the interface.
➢ Simulated ENQCMD instruction in RISC-V using gem5.
➢ Implemented a ENQCMD-based PCIe device driver as the interface that leverages De-Virtualized Memory.
➢ Simulated the database accelerator with IOMMU, supporting streaming processing including selection, projection and aggregation kernels in gem5 for statistics of performance.
➢ Wrote user-level microbenchmark, StarSchema Benchmark and TATP benchmark for evaluating the performance of the interface.

Proposal for Cilk Implementation in single-GPU Environment   *11/12/2022-11/30/2022*
➢ Identified the differences in terms of how CPU and GPU manage the function-call stack as well as the registers exposing to programmers.
➢ Proposed a software solution to implement Cilk-GPU runtime that guarantees serial execution, work-stealing and task-dependencies.
➢ The actual implementation is required to evaluate the performance.
➢ The first solution that not only does work-stealing but also preserves task dependencies, introducing minimum overhead to each worker's private function-call stack, which was not achieved by any previous work.
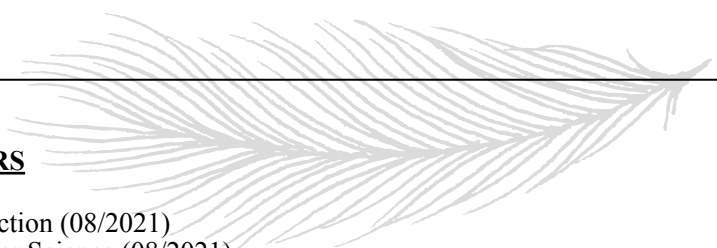
PUBLICATIONS & POSTERS

Poster: "Efficient interfaces to Near Memory Accelerators" Yusen Liu, Michael Swift.
    CRISP Annual Review, 11/2021.

Poster: "Efficient interfaces to Near Memory Accelerators" Yusen Liu, Michael Swift.
    Wisconsin Computer Architecture Affiliates, 10/2021.

AWARDS & HONORS

Graduated with Distinction (08/2021)
Distinction in Computer Science (08/2021)
Dean's List (12/2020, 05/2021)

SKILLS & EXPERIENCES

Codebases: Linux kernel, Linux device drivers, gem5, QEMU
Programming Languages: C/C++, Java, Python
Language: Mandarin (native), English (Fluent)