Ryan Wong rwong.cs.illinois.edu in ryanwong5

Research Interests

Computer architecture; memory & storage systems; emerging memory technologies; hardware accelerators for machine learning and databases; scientific computing

Education

University of Illinois Urbana-Champaign

Urbana, Illinois

2021-Present

Ph.D. in Computer Science Advisor: Saugata Ghose

University of Rochester

Rochester, New York

M.S. in Electrical Engineering

2020

Advisor: Engin Ipek

University of Rochester

Rochester, New York

B.S. in Computer Science/B.A. in Chemistry

201

Distinction in Chemistry

Professional Experience

Radiation Hardened CMOS

Sandia National Laboratories

Graduate R&D Intern

2019-2021

Co-advisors: Ben Feinberg, Sapan Agarwal

Computer Systems Architecture Laboratory

University of Rochester

(Graduate) Research Assistant

2017-2021

Àdvisor: Engin Ipek

NSF-Research Experience for Undergraduates

Salisbury University

Research Assistant

Summer 2018

Advisor: Lei Zhang

ICODES Test Group

Tapestry Solutions

Software Tester

Summer 2016, 2017

Publications & Peer-Reviewed Workshops

R. Wong, N. Kim, K. Higgs, E. Ipek, S. Agarwal, S. Ghose, and B. Feinberg, "TCAM-SSD: A Framework for Search-Based Computing in Solid-State Drives", 15^{th} Non-Volatile Memories Workshop (**NVMW**), 2024. Extended paper available on arXiv: https://arxiv.org/abs/2403.06938

- B. Feinberg, **R. Wong**, T. P. Xiao, C. H. Bennett, J. N. Rohan, E. G. Boman, M. J. Marinella, S. Agarwal, and E. Ipek, "An Analog Preconditioner for Solving Linear Systems", 27^{th} International Symposium on High-Performance Computer Architecture (HPCA), 2021.
- B. Feinberg, B. Heyman, D. Mikhailenko, **R. Wong**, A. Ho, and E. Ipek, "Commutative Data Reordering: A New Technique to Reduce Data Movement Energy on Sparse Linear Algebra Workloads", 47th International Symposium on Computer Architecture (ISCA), 2020.

B. Feinberg, B. Heyman, D. Mikhailenko, R. Wong, and E. Ipek, "Reducing Data Movement Energy via Commutative Data Reordering", Government Microcircuit Applications & Critical Technology Conference (GOMACTech), 2019.

Technical Reports

S. Agarwal, B. Feinberg, J. N. Rohan, T. P. Xiao, C. H. Bennett, E. G. Boman, M. J. Marinella, R. Wong, B. C. Heyman, D. Mikhailenko, A. C. Ho, and E. Ipek "High Precision Sparse and Dense Analog Matrix Multiplication", Sandia Report, SAND2021-12424, 2021.

Awards

Outstanding Teaching Assistant*

University of Illinois

Department of Computer Science

Hopeman Fellowship

University of Rochester

School of Engineering and Applied Sciences

2019-2020

2022

Teaching

CS 233H: Computer Architecture Honors

University of Illinois

Instructors: Ryan Wong & Prof. Geoffrey Herman

Fall 2023

Overall teaching rating 4.63/5, Overall course rating 4.63/5 (16 responses)

on List of Teachers Ranked as Excellent by Their Students

CS 233(H): Computer Architecture*

University of Illinois

Instructors: Profs. Geoffrey Herman & Saugata Ghose

Fall 2022 Fall 2021

Instructors: Profs. Geoffrey Herman & Saugata Ghose

ECE 201/401: Advanced Computer Architecture

Overall teaching rating: 4.38/5 (8 responses)

on List of Teachers Ranked as Excellent by Their Students

University of Rochester

Instructor: Prof. Engin Ipek

Fall 2019

ECE 200/400: Computer Organization

University of Rochester

Instructor: Prof. Engin Ipek

Spring 2019

CSC 172: Data Structures and Algorithms

University of Rochester

Instructor: Prof. Tamal Biswas

(Head Workshop Leader) Spring 2018

Instructor: Prof. Ted Pawlicki

Spring 2017

CSC 242: Artificial Intelligence

University of Rochester

Instructor: Prof. George Ferguson

Fall 2017

CSC 171: Introduction to Computer Science

University of Rochester

Instructor: Prof. Ted Pawlicki

(Head Workshop Leader) Fall 2017

Instructor: Prof. George Ferguson

Fall 2016

Mentoring

Jenny Liang

Abhinil Dutt

University of Illinois

Adaptive Cache Hierarchies

University of Illinois

Adaptive Cache Hierarchies

2023-Present

2023-Present

Rahul Prabhu

Senior Thesis: PUM Architectures

University of Illinois 2023-Present Jiwon (Julie) Lee University of Illinois

Senior Thesis: Adaptive Cache Hierarchies 2022-2023

Kevin Higgs University of Illinois

ISUR: In-Storage Computing 2022-2023

Nikita Kim

In-Storage Computing

University of Rochester
2019-2022

Service

O Computer Architecture Student Association (CASA) Steering Committee Member

- ISUR Mentor
- O DaRin Butz Mentor