Ryan Wong

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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**
Ph.D. in Computer Science   *2021-Present*
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   *2018*
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*
Advisor: 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", 15th 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", 27th *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 *2022*

Hopeman Fellowship **University of Rochester**
School of Engineering and Applied Sciences *2019-2020*

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*

Instructors: Profs. Geoffrey Herman & Saugata Ghose *Fall 2021*
    Overall teaching rating: 4.38/5 (8 responses)
    On List of Teachers Ranked as Excellent by Their Students

ECE 201/401: Advanced Computer Architecture **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

Abhinil Dutt **University of Illinois**
Adaptive Cache Hierarchies *2023-Present*

Jenny Liang **University of Illinois**
Adaptive Cache Hierarchies *2023-Present*

Rahul Prabhu **University of Illinois**
Senior Thesis: PUM Architectures *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 **University of Rochester**
In-Storage Computing *2019-2022*

Service

- ○ Computer Architecture Student Association (CASA) Steering Committee Member
- ○ ISUR Mentor
- ○ DaRin Butz Mentor