JEEHO RYOO

Assistant Professor
Olsen College of Engineering and Science, Fairleigh Dickinson University
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RESEARCH INTERESTS
- Computer architecture, memory systems, and operating systems
- Performance, energy efficiency, and hardware/software co-design
- Emerging workload and system characterization
- Education and learning technology

ACADEMIC APPOINTMENTS
Assistant Professor   July 2025 – Present
Olsen College of Engineering and Science, Fairleigh Dickinson University, Vancouver, BC

Assistant Professor   May 2024 – June 2025
Gildart Haase School of Computer Sciences and Engineering, Fairleigh Dickinson University, Vancouver, BC

Adjunct Professor   July 2023 – April 2024
Gildart Haase School of Computer Sciences and Engineering, Fairleigh Dickinson University, Vancouver, BC

Research Associate   March 2023 – April 2024
Laboratory for Computer Architecture, The University of Texas at Austin, Austin, TX

Faculty   August 2021 – April 2024
British Columbia Institute of Technology, Vancouver, BC, Canada

EDUCATION
The University of Texas at Austin, College of Engineering, Austin, TX   May 2017
Doctor of Philosophy in Electrical and Computer Engineering
Advisor: Lizy K. John

The University of Texas at Austin, College of Engineering, Austin, TX   May 2014
Master of Science in Electrical and Computer Engineering
Advisors: Lizy K. John

Cornell University, College of Engineering, Ithaca, NY   May 2011
Bachelor of Science in Electrical and Computer Engineering
Advisors: David H. Albonesi and Christopher Batten

PUBLICATIONS
- **Journals**

  Mohammad Faisal Iqbal, Jim Holt, **Jee Ho Ryoo**, Gustavo de Veciana and Lizy K. John, "Dynamic Core Allocation and Packet Scheduling in Multicore Network Processors." *In IEEE Transactions on Computers*, vol. 65, no. 12, December, 2016.

  Jinsuk Chung, Ikhwan Lee, Michael Sullivan, **Jee Ho Ryoo**, Don Wan Kim, Doe Hyun Yoon, Larry Karplan and Mattan Erez, "Containment Domains: A Scalable, Efficient, and Flexible Resilience Scheme for Exascale Systems." *In the Journal of Scientific Programming*, vol. 21, no. 3-4, 2013.

- **Conference Proceedings**

Jeeho Ryoo[*], Michael Pin-Chuan Lin[*], Sahil Rai, Wenhao He, Seong Min Park, and Marco Ho. "WIP: Multi-Agent Artificial Intelligence Model to Enhance Self-Regulated Learning and Conceptual Understanding in Computer Science Education." *In the Proceedings of IEEE Frontiers in Education Conference (FIE)*, Nashville, Tennessee, USA, November, 2025. ([*]both co-first authors)

Marco Ho, Carly Orr, Rebecca Jeon, Michael Pin-Chuan Lin, and **Jeeho Ryoo**. "AI Literacy Through a Project-Based Learning Course." *In the Proceedings of IEEE Smart World Congress (SWC)*, Calgary, Alberta, Canada, August, 2025.

Michael Pin-Chuan Lin, Fuhua Lin, Yu-Feng Lan and **Jeeho Ryoo**. "Perceiving Generative AI in Teacher Practice: a Design-Based Case Study in a Graduate Course." *In the Proceedings of IEEE Smart World Congress (SWC)*, Calgary, Alberta, Canada, August, 2025.

Muge Zhang, Muhammad Ali Khaliq, Byeong Kil Lee, and **Jeeho Ryoo**. "Synthetic Magnetic Resonance Imaging Generation for the Diagnosis of Alzheimer's Disease using Machine Learning." *In the Proceedings of 8th International Conference on Multimedia Information Processing and Retrieval (MIPR)*, San Jose, California, USA, August, 2025.

Cory Davis, Patrick Stockton, **Jeeho Ryoo**, and Eugene John. "Improving Energy Efficiency of Graph Neural Network Execution by using a PIM Architecture." *the 1st International Workshop on Data Centers Energy Efficiency (DCEE-2025)*, Tokyo, Japan, June, 2025.

Michael Pin-Chuan Lin, Arita Li Liu, Saeed Saffari, Daniel Chang, and **Jeeho Ryoo**. "Mapping AI Tools in Education: A Topic Modeling Analysis of Cognitive, Metacognitive, & Affective Insights." *In Proceedings of the 21st International Conference on Intelligent Tutoring Systems (ITS)*, Alexandroupolis, Greece, June 2025

Seong Min Park, Marco Ho, Michael Pin-Chuan Lin, and **Jeeho Ryoo**. "Evaluating the Impact of Assistive AI Tools on Learning Outcomes and Ethical Considerations in Programming Education." *In the Proceedings of the 16th Global Engineering Education Conference (EDUCON)*, London, UK, April 2025.

Saeed Saffari, Michael Pin-Chuan Lin, Oscar Lin, and **Jeeho Ryoo**. "Investigating Open-Source Large Language Models in Digital Pedagogies." *In the Proceedings of the 18th International Conference on e-Learning & Innovative Pedagogies*, Changhua City, Taiwan, April 2025.

Muge Zhang, Dae Yeol Lee, Vasudevan Janarthanan, and **Jeeho Ryoo**, "Microarchitectural Analysis of Pre-Processing Stage in Machine Learning Workloads." *In Proceedings of the 7th International Conference on Algorithms, Computing and Artificial Intelligence (ACAI)*, Guangzhou, China, December 2024.

Kumar, Shvetha S., Reshma R. Nayak, Jismi S. Kannampuzha, Sahil Rai, **Jeeho Ryoo**, and Lizy K. John. "Evaluation of Pruning Techniques." *In the proceedings of the 43rd International Performance, Computing, and Communications Conference (IPCCC)*, Anaheim, California, USA, November 2023.

Jensen, Steffen, Jaekyu Lee, Dam Sunwoo, Matt Horsnell, Matthew Siggs, **Jeeho Ryoo**, and Lizy John. "Do Video Encoding Workloads Stress the Microarchitecture?." *In the proceedings of the International Symposium on Workload Characterization (IISWC)*, Ghent, Belgium, October 2023.

Jee Ho Ryoo, Shuang Song and Lizy K. John, "Puzzle Memory: A Multifractional Partitioned Heterogeneous Memory Scheme." *In the Proceedings of the 36th International Conference on Computer Design (ICCD)*, Orlando, Florida, USA, October 2018.

Jee Ho Ryoo, Lizy K. John, and Arkaprava Basu, "A Case for Granularity Aware Page Migration." *In the Proceedings of the 32nd International Conference on Supercomputing (ICS)*, Beijing, China, June 2018.

Yashwant, Marathe, Nagendra Gulur, **Jee Ho Ryoo**, Shuang Song, and Lizy K. John, "CSALT: Context Switch Aware Large TLB." *In the Proceedings of the 50th International Symposium on Microarchitecture (MICRO)*, Boston Massachusetts, USA, October 2017.

Jee Ho Ryoo, Nagendra Gulur, Shuang Song and Lizy K. John, "Rethinking TLB Designs in Virtualized Environments: A Very Large Part-of-Memory TLB." *In the Proceedings of the 44th International Symposium on Computer Architecture (ISCA)*, Toronto, Ontario, Canada, June 2017.

Jee Ho Ryoo, Mitesh R. Meswani, and Lizy K. John, "SILC-FM: Subblocked InterLeaved Cache-Like Flat Memory Organization." *In the Proceedings of the 23rd International Conference on High Performance Computer Architecture (HPCA)*, Austin, Texas, USA, February 2017.

Shuang Song, Meng Li, Xinnian Zheng, **Jee Ho Ryoo**, Reena Panda, Michael LeBeane, Andreas Gerstlauer, and Lizy K. John, "Proxy-Guided Load Balancing of Graph Processing Workloads on Heterogeneous Clusters." *In the Proceedings of the 45th International Conference on Parallel Processing (ICPP)*, Philadelphia, Pennsylvania, USA, August 2016.

Reena Panda, Xinnian Zheng, **Jee Ho Ryoo**, Michael LeBeane, Shuang Song Andreas Gerstlauer, and Lizy K. John, "Genesys: Automatically Generating Representative Training-sets." *In the Proceedings of the 16th International Conference on Embedded Computer Systems: Architecture, Modeling, and Simulation (SAMOS)*, Samos Island, Greece, July 2016.

Michael LeBeane, Shuang Song, Reena Panda, **Jee Ho Ryoo**, and Lizy K. John, "Data Partitioning Strategies for Graph Workloads in Heterogeneous Clusters." *In the Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)*, Austin, Texas, USA, November 2015.

Jee Ho Ryoo, Karthik Ganesan, Yao-Min Chen, and Lizy K. John, "i-MIRROR: A Software Managed Die-Stacked DRAM-Based Memory Subsystem." *In the Proceedings of the 27th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD)*, Florianopolis, Brazil, October 2015.

Michael LeBeane, **Jee Ho Ryoo**, Reena Panda, and Lizy K. John, "WattWatcher: Fine-Grained Power Estimation For Emerging Workloads." *In the Proceedings of 2015 International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD)*, Florianopolis, Brazil, October 2015.

Reena Panda, Christopher Erb, Michael LeBeane, **Jee Ho Ryoo**, and Lizy K. John, "Performance Characterization of Modern Databases on Out-of-order CPUs." *In the Proceedings of 2015 International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD)*, Florianopolis, Brazil, October 2015.

Jee Ho Ryoo, Saddam Quirem, Michael LeBeane, Reena Panda, Shuang Song, and Lizy K. John, "GPGPU Benchmark Suites: How Well Do They Sample the Performance Spectrum." *In the Proceedings of the 44th International Symposium on Parallel Processing (ICPP)*, Beijing, China, September 2015. **(Best Paper Runner-Up)**

Wooseok Lee, Youngchun Kim, **Jee Ho Ryoo**, Dam Sunwoo, Andreas Gerstlauer, and Lizy K. John, "PowerTrain: A Learning-based Calibration of McPAT Power Models." *In the Proceedings of the International Symposium on Low Power Electronics and Design (ISLPED)*, Rome, Italy, July 2015.

Mohammad Faisal Iqbal, Jim Holt, **Jee Ho Ryoo**, Gustavo De Veciance, and Lizy K. John, "Flow Migration on Multicore Network Processors: Load Balancing While Minimizing Packet Reordering." *In the Proceedings of the 42nd International Conference on Parallel Processing (ICPP)*, Lyon, France, October 2013.

Jinsuk Chung, Ikhwan Lee, Michael Sullivan, **Jee Ho Ryoo**, Don Wan Kim, Doe Hyun Yoon, Larry Karplan, and Mattan Erez, "Containment Domains: A Scalable, Efficient, and Flexible Resilience Scheme for Exascale Systems." *In the Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)*, Salt Lake City, Utah, USA, November 2012.

- **Posters**

Cory Davis, Patrick M. Stockton, Muge Zhang, **Jeeho Ryoo**, and Eugene John, "Microarchitectural Characterization of LightGCN and ExpressGNN and Architectural Implications." 2025 High Performance, Edge And Cloud computing (HiPEAC), January, 2025

Jee Ho Ryoo, Mitesh R. Meswani, Reena Panda, and Lizy K. John, "SILC-FM: Subblocked InterLeaved Cache-Like Flat Memory Organization." 2016 International Conference on Parallel Architecture and Compilation Techniques (PACT), September, 2016.

Jee Ho Ryoo, Michael LeBeane, Mohammad Faisal Iqbal, and Lizy K. John, "Control Flow Behavior of Cloud Workloads." 2014 International Conference on Workload Characterization (IISWC), October, 2014.

PROFESSIONAL EXPERIENCES

Senior Performance Engineer   February 2018 – March 2019
ARM Inc., San Jose, CA
- Implemented DRAM cache simulation infrastructure modeling future ARM server systems
- Developed caching and prediction schemes tailored for emerging memory technology

Senior Software Engineer   July 2017 – February 2018
Oracle Corporation, Santa Clara, CA
- Identified bottleneck in Transparent Huge Pages (THP) when running enterprise applications
- Analyzed cloud application performance across various hardware platforms

Research Engineering Intern   May 2016 – December 2016
Advanced Micro Devices, Austin, TX
- Proposed granularity aware migration schemes in heterogeneous memory systems
- Implemented dynamic granularity migration schemes on Linux kernel running on real x86-64 systems

Research Engineering Intern   September 2015 – December 2015
Advanced Micro Devices, Austin, TX
- Proposed bandwidth efficient and high capacity utilization die-stacked DRAM management policy
- Developed heterogeneous memory simulation platform incorporating emerging memory technologies

Software Engineering Intern   May 2013 – August 2013
Oracle Corporation, Santa Clara, CA
- Proposed hardware-assisted, software-managed die-stacked DRAM management policy
- Evaluated the proposed scheme with commercial benchmarks such as SPECjbb, SPECjEnterprise, TPC-C

Performance Architecture Intern   May 2012 – August 2012
Samsung Austin R&D Center, Austin, TX
- Developed the SimPoint tool for ARM ISA to analyze various Android benchmarks
- Evaluated various power-efficient floating point schedulers using the Gem5 simulator

Graduate Research Assistant   August 2011 – May 2017
Laboratory for Computer Architecture, The University of Texas at Austin, Austin, TX
- Proposed management policies for high bandwidth, low latency die-stacked DRAM technology
- Developed other uses of die-stacked DRAM such as a large TLB in virtual platforms

Undergraduate Research Assistant   June 2010 – May 2011
Computer Systems Laboratory, Cornell University, Ithaca, NY
- Developed a digital ASIC tool-flow chain to synthesize the Verilog MIPS R10K microprocessor model
- Incorporated clock gating techniques at the functional block level (e.g. ALU, ROB) for power efficiency

Project Team Co-Director – Big Red Chip   September 2010 – May 2011
Computer Systems Laboratory, Cornell University, Ithaca, NY
- Designed a superscalar OOO processor and on-board I/O interfaces on Xilinx Virtex-6 FPGA
- Provided project design guidelines for 5 sub-design teams and managed the project deadline

TEACHING EXPERIENCES

Assistant Professor in Olsen College of Engineering and Science
Fairleigh Dickinson University, Vancouver, BC

- CSCI 6806 – Computer Science Graduate Capstone Project (Fall 2025)
- CSCI 5565 – Assembly Programming (Fall 2025)
- INFO 4201– Information Technology Needs Assessment and Management (Fall 2025)

Assistant Professor in Gildart Haase School of Computer Sciences and Engineering
Fairleigh Dickinson University, Vancouver, BC
- CSCI 6806 – Computer Science Graduate Capstone Project (Summer 2025, Spring 2025, Fall 2024, Summer 2024)
- CSCI 5565 – Assembly Programming (Summer 2024)
- INFO 4201– Information Technology Needs Assessment and Management (Fall 2025)

Adjunct Professor in Gildart Haase School of Computer Sciences and Engineering
Fairleigh Dickinson University, Vancouver, BC
- CSCI 5565 – Assembly Programming (Spring 2024)
- CSCI 5565 – Assembly Programming (Spring 2024)
- CSCI 5565 – Assembly Programming (Summer 2023, Fall 2023, Spring 2024)

Faculty in the School of Computing and Academic Studies
British Columbia Institute of Technology, Vancouver, BC
- COMP 2510 – Procedural Programming in C (Winter 2022, Fall 2022, Winter 2023, Fall 2023)
- COMP 3522 – Object Oriented Programming 2 (Fall 2021, Winter 2022)
- COMP 4736 – Introduction to Operating Systems (Winter 2023)
- COMP 4800 – Projects Practicum 2 (Spring 2023)
- COMP 7035 – Operating Systems (Fall 2023)

Teaching Assistant
Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX
- EE306 (Instructor: Yale Patt) – Introduction to Computing (Fall 2011)
- EE382N (Instructor: Lizy John) – Performance Evaluation and Benchmarking (Fall 2014)
- EE460N (Instructor: Mattan Erez) – Computer Architecture (Spring 2012)

Teaching Assistant
Electrical and Computer Engineering, Cornell University, Ithaca, NY
- ENGRD2300 (Instructors: David H. Albonesi, Adam W. Bojanczyk, José F. Martinez, and Edward G. Suh) – Introduction to Digital Logic Design (Spring 2010, Fall 2010, Spring 2011)

PROFESSIONAL SERVICES
Chair
- IEEE International Workshop on Smart Education in the Age of Generative AI (SEGA): 2025 (Co-Chair)

Technical Program Committee
- IEEE International Conference on Performance, Computing and Communications (IPCCC): 2025, 2024
- IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC'25): 2025
- IEEE International Parallel and Distributed Processing Symposium (IPDPS): 2025
- Supercomputing India (SCI): 2025

Reviewer
- ACM Computing Surveys: 2025, 2024
- IEEE Frontier in Education (FIE): 2025
- IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC): 2025
- Simulation Modelling Practice and Theory (SIMPAT): 2016
- IEEE Transactions on Computers (TC): 2015

Student Volunteer
- IEEE International Symposium on Workload Characterization (IISWC): 2011

● ACM/SPEC International Conference on Performance Engineering (ICPE): 2015

UNIVERSITY SERVICES
Chair
  ● Research Release Time (RRT) Committee, Gildart Haase School of Computer Sciences and Engineering: 2025

Committee Member
  ● Search Committee for the Chair of the Department of Computer Science and Math, Olsen College of Engineering and Science: 2025
  ● Search Committee for the Director of Gildart Haase School of Engineering, Olsen College of Engineering and Science: 2025

Supervisor of Industry Sponsored Projects
  ● BinanceUS: Fall 2024
  ● UnifiedAI: Fall 2024

University Recruitment Representative
  ● QS Discover Master's Fair: Fall 2024

GRANTS
Fairleigh Dickinson University Grant-in-aid: 2,000 USD (2025-2026)
Google Cloud Research Credits (PI): Synthetic Input Generation for Alzheimer Diseases (2024-2025) 6921.75 USD

STUDENTS
Current Students
  ● Weidong Zhang, MS (Northeastern University): 2025 - Present
  ● Dashi Yang, MS (FDU): 2025-Present
  ● Jinxin Yin, MS (FDU): 2025-Present
  ● Seong Min Park, MS (FDU): 2025-Present
  ● Ebod Shojaei, BS (BCIT): 2024-Present
  ● Sahil Rai, BS (BCIT): 2023-Present

Past Students
  ● Muge Zhang, MS (FDU): 2024-2025
  ● Rebecca Jeon, BS (University of Victoria): 2025

INVITED TALKS
"Future of Computing and AI Impact," *Vancouver Korean IT Conference*, Vancouver, BC, July 15, 2023

PATENTS
Intelligently Partitioning Data Cache to Allocate Space for Translation Entries, Lizy K. John, **Jee Ho Ryoo**, Yashwant Marathe, Nagendra Gulur.
US Patent 10261915B2

Methodology to Utilize Heterogeneous Memories with Variable Properties, Lizy K. John, **Jee Ho Ryoo**, Hung-Ming Hsu, Karthik, Ganesan.
US Patent 20180260323A1

Page-Migration with Varying Granularity. Arkaprava Basu, and **Jee Ho Ryoo**.
US Patent 10503658B2

Processor Using a Level 3 Translation Lookaside Buffer Implemented in Off-Chip or Die-Stacked Dynamic Random-Access Memory. Lizy K. John, Nagendra Gulur, and **Jee Ho Ryoo**.
US Patent 10296465B2

Data Block Sizing for Channels in a Multi-Channel High-Bandwidth Memory. **Jee Ho Ryoo**, and Mitesh R. Meswani.
US Patent 10503655B2

Low Latency, High Bandwidth Memory Subsystem Incorporating Die-Stacked DRAM. **Jee Ho Ryoo**, Karthik Ganesan, and Yao-Min Chen.
US Patent 9406361B2

AWARDS
Samsung Award of Excellence (2012) – Intern award recipient for excellent work performance
Engineering Learning Initiatives (2010) – Motorola research funding recipient for two semesters
Roger Berman '70 Memorial Prize (2010) – Top presentation student in engineering communications program