PROFESSOR DI WU

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APPOINTMENT

Assistant Professor | *Electrical and Computer Engineering* — Aug. 2023 – Present
University of Central Florida — Orlando, FL, USA
Joint Assistant Professor | *Computer Science* — Aug. 2023 – Present
University of Central Florida — Orlando, FL, USA

EDUCATION

Doctor of Philosophy | *Electrical and Computer Engineering* — Sep. 2017 – Jul. 2023
University of Wisconsin–Madison — Madison, WI, USA
- Advisor: Joshua San Miguel
- Thesis: Power-Efficient Computer Architecture via Unary and Approximate Computing
  🏅 Harold Peterson Outstanding Dissertation Award

Master of Engineering | *Microelectronics* — Sep. 2012 – Jan. 2015
Fudan University — Shanghai, China
Bachelor of Science | *Microelectronics* — Sep. 2007 – Jul. 2012
Fudan University — Shanghai, China

RESEARCH INTEREST

- Computer architecture
  — efficiency, etc.

- Emerging computing
  — unary, neuromorphic, quantum, etc.

- Domain specific acceleration
  — AI, BCI, cryptography, etc.

- Heterogeneous system
  — CXL, etc.

HONORS AND AWARDS

Harold Peterson Outstanding Dissertation Award ↗ — 2024
UW–Madison
Distinguished Artifact Evaluation Award ↗ — 2024
ASPLOS
Machine Learning and Systems Rising Star ↗ — 2023
MLCommons
Capstone PhD Teaching Award Nomination — 2022
UW–Madison
Grainger Wisconsin Distinguished Graduate Fellowship — 2022
1 of the 3 PhD students selected from College of Engineering, UW–Madison
Student Travel Award — 2022
ISCA
Dissertator Travel Award (twice) — 2022
UW–Madison
Ph.D. Forum Invitation — 2021
DAC
IEEE Micro Top Pick ↗ — 2021
1 of the 12 publications selected from all computer architecture publications in 2020
Gerald Holdridge Outstanding Teaching Assistant Award — 2020
UW–Madison
Chancellor's Opportunity Fellowship — 2019
UW–Madison
Student Research Travel Award — 2019
UW–Madison
Student Research Competition Travel Award — 2019
ASPLOS
Student Travel Award — 2019
ASPLOS
Qualcomm Innovation Fellowship Finalist ↗ — 2019
Qualcomm
Foxconn SmartCity Competition Winner — 2019
Foxconn

Hiran Mayukh Award [↗]   2018
  UW–Madison
Rising Star Award   2015
  HiSilicon
National Scholarship (ranking 1/67)   2015
  Fudan University
Excellent Student Union Leader   2010
  Fudan University
Third Prize Freshman Scholarship (ranking 3/45)   2007
  Fudan University

PUBLICATIONS

Conference

[1] LoAS: Fully Temporal-Parallel Datatflow for Dual-Sparse Spiking Neural Networks
     Ruokai Yin, Youngeun Kim, Di Wu, Priyadarshini Panda
     International Symposium on Microarchitecture, 2024

[2] Evaluating Unary GEMM for Low-Precision AI: Toward Scalable Energy-Efficient DL Accelerators
     Prabhu Vellaisamy, Harideep Nair, Di Wu, Shawn Blanton, John Paul Shen
     IEEE Computer Society Annual Symposium on VLSI, 2024

[3] ALISA: Accelerating Large Language Model Inference via Sparsity-Aware KV Caching
     Youpeng Zhao, Di Wu, Jun Wang
     International Symposium on Computer Architecture, 2024

[4] Carat: Unlocking Value-Level Parallelism for Multiplier-Free GEMMs
     Zhewen Pan, Joshua San Miguel, Di Wu
     International Conference on Architectural Support for Programming Languages and Operating Systems, 2024
     Open-source artifact [↗]
     🏅 Distinguished Artifact Evaluation Award

[5] uBrain: A Unary Brain Computer Interface
     Di Wu, Jingjie Li, Zhewen Pan, Younghyun Kim, Joshua San Miguel
     International Symposium on Computer Architecture, 2022

[6] uSystolic: Byte-Crawling Unary Systolic Array
     Di Wu, Joshua San Miguel
     International Symposium on High-Performance Computer Architecture, 2022
     Open-source software: uSystolic-Sim [↗]

[7] When Dataflows Converge: Reconfigurable and Approximate Computing for Emerging Neural Networks
     Di Wu, Joshua San Miguel
     International Conference on Computer Design, 2021

[8] UNO: Virtualizing and Unifying Nonlinear Operations for Emerging Neural Networks
     Di Wu, Jingjie Li, Setareh Behrooz, Younghyun Kim, Joshua San Miguel
     International Symposium on Low Power Electronics and Design, 2021

[9] Normalized Stability: A Cross-Level Design Metric for Early Termination in Stochastic Computing
     Di Wu, Ruokai Yin, Joshua San Miguel
     Asia and South Pacific Design Automation Conference, 2021

[10] uGEMM: Unary Computing Architecture for GEMM Applications
     Di Wu, Jingjie Li, Ruokai Yin, Hsuan Hsiao, Younghyun Kim, Joshua San Miguel
     International Symposium on Computer Architecture, 2020
     Open-source software: UnarySim [↗]
     🏅 Awarded 1 out of 12 IEEE Micro Top Picks 2021 from all computer architecture publications in 2020

[11] Approximate Hardware Techniques for Energy-Quality Scaling Across the System
     Younghyun Kim, Joshua San Miguel, Setareh Behroozi, Tianen Chen, Kyuin Lee, Yongwoo Lee, Jingjie Li, Di Wu
     International Conference on Electronics, Information, and Communication, 2020

[12] SECO: A Scalable Accuracy Approximate Exponential Function Via Cross-Layer Optimization
     Di Wu, Tianen Chen, Chienfu Chen, Oghenefego Ahia, Joshua San Miguel, Mikko Lipasti, Younghyun Kim
     International Symposium on Low Power Electronics and Design, 2019

[13] In-Stream Stochastic Division and Square Root via Correlation
     Di Wu, Joshua San Miguel
     Design Automation Conference, 2019

[14] Convergence-Optimized Variable Node Structure for Stochastic LDPC Decoder
Qichen Zhang, Yun Chen, Di Wu, Xiaoyang Zeng, Yeong-luh Ueng
International Conference on Acoustics, Speech and Signal Processing, 2016

[15] An Area-Efficient Architecture for Stochastic LDPC Decoder
Qichen Zhang, Yun Chen, Di Wu, Xiaoyang Zeng, Yeong-luh Ueng
International Conference on Digital Signal Processing, 2015

[16] Latency-Optimized Stochastic LDPC Decoder for High-Throughput Applications
Di Wu, Yun Chen, Qichen Zhang, Lirong Zheng, Xiaoyang Zeng, Yeong-luh Ueng
International Symposium on Circuits and Systems, 2015

[17] A High-Throughput LDPC Decoder for Optical Communication
Di Wu, Yun Chen, Yuebin Huang, Yeongluh Ueng, Lirong Zheng, Xiaoyang Zeng
International Conference on ASIC, 2013

Journal

[1] Synergizing Quantum Techniques with Machine Learning for Advancing Drug Discovery Challenge
Xiaowei Xu, Zhiding Liang, Zichang He, Yue Sun, Dylan Herman, Qingyue Jiao, Yanzhang Zhu, Weiwen Jiang, Di Wu, Marco Pistoia, Yiyu Shi
Scientific Reports (2025)

[2] uGEMM: Unary Computing for GEMM Applications
Di Wu, Jingjie Li, Ruokai Yin, Hsuan Hsiao, Younghyun Kim, Joshua San Miguel
IEEE Micro 41.3 (2021), pp. 50–56
🏆 IEEE Micro Top Pick Issue 2021

[3] In-Stream Correlation-Based Division and Bit-Inserting Square Root in Stochastic Computing
Di Wu, Ruokai Yin, Joshua San Miguel
IEEE Design & Test 38.6 (2021), pp. 53–59

[4] Strategies for Reducing Decoding Cycles in Stochastic LDPC Decoders
Di Wu, Yun Chen, Qichen Zhang, Yeong-luh Ueng, Xiaoyang Zeng
IEEE Transactions on Circuits and Systems II: Express Briefs 63.9 (2016), pp. 873–877

[5] An Efficient Multirate LDPC-CC Decoder With a Layered Decoding Algorithm for the IEEE 1901 Standard
Yun Chen, Qichen Zhang, Di Wu, Changsheng Zhou, Xiaoyang Zeng
IEEE Transactions on Circuits and Systems II: Express Briefs 61.12 (2014), pp. 992–996

Workshop

[1] Leveraging Photonic Interconnects for Scalable and Efficient Fully Homomorphic Encryption
Dewan Saiham, Di Wu, Sazadur Rahman
Government Microcircuit Applications & Critical Technology Conference (2025)

[2] Synergizing Error Suppression, Mitigation and Correction for Fault-Tolerant Quantum Computing
Yanzhang Zhu, Siyuan Niu, Di Wu
IEEE Workshop on Quantum Intelligence, Learning & Security, collocated with International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (2024)

[3] Exploration of Unary Arithmetic-Based Matrix Multiply Units for Low Precision DL Accelerators
Prabhu Vellaisamy, Harideep Nair, Di Wu, Shawn Blanton, John Paul Shen
Workshop on Unary Computing, collocated with International Conference on Architectural Support for Programming Languages and Operating Systems (2024)

[4] xBrain: Brain-Like Computing for Explainable Brain-Computer Interfaces
Queenly Xie, Prabhu Vellaisamy, Di Wu
Young Architect Workshop, collocated with International Conference on Architectural Support for Programming Languages and Operating Systems (2024)

[5] T-MAC: Temporal Multiplication with Accumulation
Zhewen Pan, Di Wu, Joshua San Miguel
Young Architect Workshop, collocated with International Conference on Architectural Support for Programming Languages and Operating Systems (2022)

INVITED TALKS

Salvage Deep Learning Efficiency: A Unary Computing Approach

ShanghaiTech University	Dec. 2024
Fudan University	Dec. 2024

Case Western Reserve University	Oct. 2024
Peking University	Aug. 2024
University of Minnesota Twin Cities	Mar. 2024
University of Louisiana at Lafayette	Nov. 2023

Unary Computing for Power-Efficient Computer Architecture

AMD Research	Jul. 2023
University of Central Florida	Feb. 2023
University of California, Los Angeles	Nov. 2022
University of California, Santa Barbara	Oct. 2022

EMPLOYMENT

Research Assistant	Sep. 2017 – Jul. 2023
Department of Electrical and Computer Engineering, UW–Madison	Madison, WI, USA
Research Intern	May 2022 – Sep. 2022
Cerebras Systems	Sunnyvale, CA, USA
Research Intern	May 2020 – Sep. 2020
Cerebras Systems	Sunnyvale, CA, USA
Research Intern	May 2019 – Sep. 2019
Meta (Formerly Facebook)	Palo Alto, CA, USA
Digital Circuit Engineer	Mar. 2015 – May 2017
HiSilicon	Shanghai, China
Research Assistant	Sep. 2012 – Jan. 2015
State Key Laboratory of ASIC and System, Fudan University	Shanghai, China

TEACHING AND MENTORING

Instructor	
EEE3342C (Digital Systems), UCF	Fall 2024
EEL5796 (Big Data Computer Architecture and Systems), UCF	Spring 2024
ECE697 (Capston Project in Machine Learning and Signal Processing), UW–Madison	Summer 2023
Teaching Assistant	
ECE554 (Digital Engineering Lab), UW–Madison	Spring 2022
ECE454 (Mobile Computing Lab), UW–Madison	Fall 2021
ECE454 (Mobile Computing Lab), UW–Madison	Fall 2020
ECE554 (Digital Engineering Lab), UW–Madison	Spring 2020
ECE554 (Digital Engineering Lab), UW–Madison	Fall 2019
ECE554 (Digital Engineering Lab), UW–Madison	Spring 2019
ECE554 (Digital Engineering Lab), UW–Madison	Fall 2018
ECE552 (Introduction to Computer Architecture), UW–Madison	Fall 2018
Guest Lecturer	
ECE757 (Advanced Computer Architecture II), UW–Madison	Spring 2021
ECE757 (Advanced Computer Architecture II), UW–Madison	Spring 2020
ECE752 (Advanced Computer Architecture I), UW–Madison	Spring 2019

PROFESSIONAL SERVICE

Panelist	
NSF Medium Panel in Division of Computer and Network Systems (CNS)	2024
IEEE Workshop on Quantum Intelligence, Learning & Security (QUILLS)	2024
Committee	
Organizing Chair of Workshop on Architecting Error Corrected Quantum Computers (ARQTEC)	2025
Organizing Chair of Undergrad Panel on "Charging STEM Career" at UCF	2024
Organizing Chair of Workshop on Unary Computing (WUC)	2024
Organizing Committee of Quantum Computing for Drug Discovery Challenge at ICCAD	2023
Program Committee of ISCA	2024, 2025
Program Committee of HPCA	2024, 2025
Program Committee of IISWC	2023
Program Committee of ISPASS	2024, 2025
Program Committee of IPDPS	2025
Program Committee of DAC	2025
Program Committee of ICCAD	2024
Program Committee of DAC PhD Forum	2024
Program Committee of ICCD	2023, 2024
Program Committee of ICRC	2024
Program Committee of ICA3PP	2023
Program Committee of IEEE Workshop on Quantum Intelligence, Learning & Security (QUILLS)	2024

Program Committee of Young Architect Workshop (YArch)	2023, 2024, 2025
Program Committee of ASPLOS Artifact Evaluation	2020, 2021
Program Committee of MICRO Artifact Evaluation	2021

Mentor

UCF IEEE Engineering in Medicine and Biology Society (EMBS) Student Branch Chapter	2024
Computer Architecture Long-term Mentoring (CALM)	2024
Young Architect Workshop (YArch)	2023
Undergrad Architecture Mentoring Workshop (uArch)	2023, 2024
MICRO – "Meet a Senior PhD Student"	2020

Journal Reviewer

ACM Transactions on Architecture and Code Optimization (TACO)
ACM Transactions on Embedded Computing Systems (TECS)
ACM Transactions on Reconfigurable Technology and Systems (TRETS)
IEEE Transactions on Circuits and Systems I (TCAS-I)
IEEE Transactions on Computers (TC)
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)
IEEE Signal Processing Letters (SPL)
Journal of Network and Computer Applications (JNCA)

FUNDING

AMD AI & HPC Fund	2024
AMD	
AMD Fund for Academic Research (Unrestricted Gift)	2024
AMD	$100,000

FORMER STUDENTS

Parker McLeod	2024
AMD Orlando	Full-time
Tyler Goldsmith	2024
AMD Orlando	Full-time
Mustafa Nisar	2024
AMD Toronto	Co-op
Zhewen Pan	2022
Department of Electrical and Computer Engineering, UW–Madison	PhD
Ruokai Yin	2021
Department of Electrical Engineering, Yale University	PhD

REFERENCE

Professor Joshua San Miguel	PhD advisor
jsanmiguel@wisc.edu	University of Wisconsin–Madison
Professor Younghyun Kim	PhD committee member
younghyun.kim@wisc.edu	University of Wisconsin–Madison
Professor John Paul Shen	
jpshen@cmu.edu	Carnegie Mellon University
Professor Timothy Sherwood	
sherwood@cs.ucsb.edu	University of California, Santa Barbara
Professor Ulya R. Karpuzcu	
ukarpuzc@umn.edu	University of Minnesota, Twin Cities