

PROFESSOR DI WU

✉ di.wu@ucf.edu

🏠 www.unarylab.com

📍 4328 Scorpius Street, Orlando, FL, 32816-2362, US

FACULTY APPOINTMENT

Assistant Professor | *Electrical and Computer Engineering*
University of Central Florida

Aug. 2023 – Present
Orlando, FL, USA

EDUCATION

Doctor of Philosophy | *Electrical and Computer Engineering*
University of Wisconsin–Madison

Sep. 2017 – Jul. 2023
Madison, WI, USA

- Advisor: Joshua San Miguel
- Thesis: Power-Efficient Computer Architecture via Unary and Approximate Computing

Master of Engineering | *Microelectronics*
Fudan University

Sep. 2012 – Jan. 2015
Shanghai, China

Bachelor of Science | *Microelectronics*
Fudan University

Sep. 2007 – Jul. 2012
Shanghai, China

RESEARCH INTEREST

- Computer architecture
— efficiency, etc.
- Emerging computing
— neuromorphic, quantum, etc.
- Domain specific acceleration
— AI, BCI, cryptography, etc.
- Heterogeneous system
— CXL, etc.

HONORS AND AWARDS

Machine Learning and Systems Rising Star
MLCommons

2023

Capstone PhD Teaching Award Nomination
UW–Madison

2022

Grainger Wisconsin Distinguished Graduate Fellowship
1 of the 3 PhD students selected from College of Engineering, UW–Madison

2022

Student Travel Award
International Symposium on Computer Architecture (ISCA)

2022

Dissertator Travel Award (twice)
Department of Electrical and Computer Engineering, UW–Madison

2022

Ph.D. Forum Invitation Design Automation Conference (DAC)	2021
IEEE Micro Top Pick  1 of the 12 publications selected from all computer architecture publications in 2020	2021
Gerald Holdridge Outstanding Teaching Assistant Award Department of Electrical and Computer Engineering, UW–Madison	2020
Chancellor’s Opportunity Fellowship UW–Madison	2019
Student Research Travel Award UW–Madison	2019
Student Research Competition Travel Award International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)	2019
Student Travel Award International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)	2019
Qualcomm Innovation Fellowship Finalist  Qualcomm	2019
Foxconn SmartCity Competition Winner Foxconn	2019
Hiran Mayukh Award  UW–Madison Computer Architecture Community	2018
Rising Star Award HiSilicon	2015
National Scholarship (ranking 1/67) Fudan University	2015
Excellent Student Union Leader Zhangjiang Campus, Fudan University	2010
Third Prize Freshman Scholarship (ranking 3/45) Fudan University	2007


PUBLICATIONS

Conference

- [1] uBrain: A Unary Brain Computer Interface [Acceptance rate=16.8%]
Di Wu, Jingjie Li, Zhewen Pan, Younghyun Kim, Joshua San Miguel
International Symposium on Computer Architecture (ISCA), 2022

- [2] uSystolic: Byte-Crawling Unary Systolic Array [Acceptance rate=30.5%]
Di Wu, Joshua San Miguel
International Symposium on High-Performance Computer Architecture (HPCA), 2022
[Open-source software: uSystolic-Sim](#) 
- [3] When Dataflows Converge: Reconfigurable and Approximate Computing for Emerging Neural Networks [Invited]
Di Wu, Joshua San Miguel
International Conference on Computer Design (ICCD), 2021
- [4] UNO: Virtualizing and Unifying Nonlinear Operations for Emerging Neural Networks [Acceptance rate=26.4%]
Di Wu, Jingjie Li, Setareh Behrooz, Younghyun Kim, Joshua San Miguel
International Symposium on Low Power Electronics and Design (ISLPED), 2021
- [5] Normalized Stability: A Cross-Level Design Metric for Early Termination in Stochastic Computing [Acceptance rate=30.2%]
Di Wu, Ruokai Yin, Joshua San Miguel
Asia and South Pacific Design Automation Conference (ASP-DAC), 2021
- [6] uGEMM: Unary Computing Architecture for GEMM Applications [Acceptance rate=18.3%]
Di Wu, Jingjie Li, Ruokai Yin, Hsuan Hsiao, Younghyun Kim, Joshua San Miguel
International Symposium on Computer Architecture (ISCA), 2020
[Open-source software: UnarySim](#) 
 **Awarded 1 out of 12 IEEE Micro Top Picks 2021 from all computer architecture publications in 2020**
- [7] Approximate Hardware Techniques for Energy-Quality Scaling Across the System [Invited]
 Younghyun Kim, Joshua San Miguel, Setareh Behrooz, Tianen Chen, Kyuin Lee, Yongwoo Lee, Jingjie Li, **Di Wu**
International Conference on Electronics, Information, and Communication (ICEIC), 2020
- [8] SECO: A Scalable Accuracy Approximate Exponential Function Via Cross-Layer Optimization [Acceptance rate=35.2%]
Di Wu, Tianen Chen, Chienfu Chen, Oghenefego Ahia, Joshua San Miguel, Mikko Lipasti, Younghyun Kim
International Symposium on Low Power Electronics and Design (ISLPED), 2019
- [9] In-Stream Stochastic Division and Square Root via Correlation [Acceptance rate=18.9%]
Di Wu, Joshua San Miguel
Design Automation Conference (DAC), 2019
- [10] 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 (ICASSP), 2016
- [11] 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 (DSP), 2015
- [12] 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 (ISCAS), 2015
- [13] A High-Throughput LDPC Decoder for Optical Communication
Di Wu, Yun Chen, Yuebin Huang, Yeongluh Ueng, Lirong Zheng, Xiaoyang Zeng
International Conference on ASIC (ASICON), 2013


Journal

- [1] uGEMM: Unary Computing for GEMM Applications [Acceptance rate=9.9%]
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**
- [2] 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
- [3] 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
- [4] 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] T-MAC: Temporal Multiplication with Accumulation
Zhewen Pan, **Di Wu**, Joshua San Miguel
Young Architect Workshop (YArch), collocated with International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS) (2022)

Pre-Print

- [1] Representation Range Needs for 16-Bit Neural Network Training
Valentina Popescu, Abhinav Venigalla, **Di Wu**, Robert Schreiber
arXiv Pre-print (2021)
[Resource: Mixed-Precision Training – Data Formats – CB16 Half-Precision](#) 

INVITED TALKS

Power-Efficient Computer Architecture via Unary Computing AMD Research (Virtual)	Jul. 2023
Unary Computing for Power-Efficient Computer Architecture University of Central Florida	Feb. 2023 Orlando, FL, USA
Unary Computing for Power-Efficient Computer Architecture University of California, Los Angeles (Virtual)	Nov. 2022 Los Angeles, CA, USA
uBrain: A Unary Brain Computer Interface University of Central Florida (Virtual)	Nov. 2022 Orlando, FL, USA
Unary Computing for Power-Efficient Computer Architecture University of California, Santa Barbara (Virtual)	Oct. 2022 Santa Barbara, CA, USA

EMPLOYMENT

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

TEACHING AND MENTORING

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

PROFESSIONAL SERVICE

Committee Member

IEEE International Symposium on High-Performance Computer Architecture (HPCA)	2024
IEEE International Conference on Computer Design (ICCD)	2023
IEEE International Symposium on Workload Characterization (IISWC)	2023
Young Architect Workshop (YArch)	2023
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS) – Artifact Evaluation	2021
International Symposium on Microarchitecture (MICRO) – Artifact Evaluation	2021
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS) – Artifact Evaluation	2020

Contest Organizer

ACM/IEEE Contest for Machine Learning on Hardware at International Conference on Computer-Aided Design (ICCAD) – Track 2: Quantum Computing for Drug Discovery Challenge	2023
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Program Mentor

Young Architect Workshop (YArch)	2023
Undergrad Architecture Mentoring Workshop (uArch)	2023
International Symposium on Microarchitecture (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 Computers (TC)	
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)	
Journal of Network and Computer Applications (JNCA)	

FORMER STUDENTS

Ruokai Yin	2021
Department of Electrical Engineering, Yale University	PhD
Zhewen Pan	2022
Department of Electrical and Computer Engineering, UW–Madison	PhD

REFERENCE

Professor Joshua San Miguel
jsanmiguel@wisc.edu

PhD advisor
University of Wisconsin–Madison

Professor Younghyun Kim
younghyun.kim@wisc.edu

PhD committee member
University of Wisconsin–Madison

Professor Timothy Sherwood
sherwood@cs.ucsb.edu

University of California, Santa Barbara

Professor John Paul Shen
jpshen@cmu.edu

Carnegie Mellon University

Professor Ulya R. Karpuzcu
ukarpuzc@umn.edu

University of Minnesota, Twin Cities