Zhewen Pan

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Education

University of Wisconsin-Madison, Electrical and Computer Engineering — 2022 - Present
PhD

- Advisor: Joshua San Miguel
- Research interest: Efficient Architectures and Systems

University of Wisconsin-Madison, Electrical and Computer Engineering — 2020 - 2022
Master of Science in Computer Engineering (GPA 3.94/4.0)

- Relevant coursework: Computer Architecture, Operating Systems, Compilers, High Performance Computing.

Purdue University, Electrical and Computer Engineering — 2016 - 2020
Bachelor of Science with Highest Distinction (GPA 3.99/4.0)

- Relevant coursework: Computer Organization, DNNs, Statistical Machine Learning.

Awards & honors

Fellowships & scholarships

Google PhD Fellowship	2025
Google "Sustainability for AI Datacenters" N+1 Institute Reverse Pitch Competition Scholarship, 1st place	2024
Wisconsin Distinguished Graduate Fellowship - Schneider	2022

Research

CACM Research Highlights	2026
IEEE Micro Top Picks	2026
Best Paper Honorable Mention, ISCA	2025
IEEE Micro Top Picks Honorable Mention	2025
Distinguished Artifact Award, ASPLOS	2024
ACM Student Research Competition (SRC) Grand Finals Grad Division, 2nd place	2023
ACM Student Research Competition (SRC) SIGMICRO Grad Division, Gold Medal	2023

Academic

Rising Stars in EECS, MIT&BU	2025
Sarah and David Epstein Teaching Fellow, UW-Madison ECE	2025
Gerald Holdridge Teaching Excellence Award, UW-Madison ECE	2024

Publications – conferences

ISCA 2025 *The XOR Cache: A Catalyst for Compression* **(Best Paper Honorable Mention; IEEE Micro Top Picks 2026; CACM Research Highlights)**
Zhewen Pan, Joshua San Miguel

ASPLOS 2024 *Carat: Unlocking Value-Level Parallelism in GEMMs* **(IEEE Micro Top Picks 2025 Honorable Mention; Distinguished Artifact Award)**
Zhewen Pan, Joshua San Miguel, Di Wu

ISCA 2022 *uBrain: A Unary Brain Computer Interface*
Di Wu, Jingjie Li, Zhewen Pan, Younghyun Kim, Joshua San Miguel

Publications – journals and magazines

IEEE Micro 2026 *Compressing for Compression with the XOR Cache*
Zhewen Pan, Joshua San Miguel

CACM-RH 2026 *Catalyzing Compression with the XOR Cache*
Zhewen Pan, Joshua San Miguel

Publications – workshops

WUC 2026 *SCoRe: Stochastic Compressed Representations*
Paridhi Gupta, Zhewen Pan, Julie Hsiao, Joshua San Miguel
(Workshop on Unary Computing at ASPLOS)

ACM SRC 2023 *The XOR Cache: A Catalyst for Compression* **(SRC SIGMICRO Gold Medal; Grand Finals 2nd Place)**
Zhewen Pan, Joshua San Miguel
(ACM Student Research Competition at Micro)

YArch 2022 *T-MAC: Temporal Multiplication with Accumulation*
Zhewen Pan, Di Wu, Joshua San Miguel
(Young Architect Workshop at ASPLOS)

Research

XOR Cache: A Catalyst for Compression Sep 2022 - Nov 2024

- Identified cross-level value redundancy in caches and reframed it as an opportunity for compression.
- Designed a compressed cache that co-locates similar lines by XOR pairing, enhancing compressibility and efficiency.

Carat: Unlocking Value-Level Parallelism in GEMMs Dec 2021 - Mar 2023

- Introduced value-level parallelism to reduce redundant computation by processing only unique input values in AI workloads.
- Designed a GEMM accelerator that reuses results via temporal subscription and value delivery for efficient execution.

uBrain: Unary Computing Brain Computer Interface Oct 2021 - Mar 2022

- Designed and synthesized unary hardware modules and performed regression analysis on efficiency statistics.

Scalable Deadlock-Freedom Network-on-Chip Jan 2021 - May 2021

- Characterized deadlock criticality based on impact of positive feedback loops between congestion and deadlock formation.
- Proposed and evaluated a scalable subactive deadlock-removal scheme based on packet bypassing using gem5-Garnet.

Employment

NVIDIA May 2026 - Aug 2026
Architecture Research Intern *Santa Clara, CA*

Arm Inc May 2021 - Aug 2021
System IP Interconnect Performance Modeling Intern *Austin, TX (Remote)*

Professional service

HPCA Training Review Committee 2027
ISCA Undergrad Architecture Workshop (uArch) Grad Student Panelist 2025
ISCA Undergrad Architecture Workshop (uArch) Mentor 2023, 2025
MICRO Artifact Evaluation Program Committee 2022

Teaching

Teaching Assistant, UW-Madison, ECE/CS 552: Introduction to Computer Architecture 23F, 24S, 25S, 25F
Teaching Assistant, UW-Madison, ECE 554: Digital Engineering Laboratory 22S
Teaching Assistant, Purdue, ECE 270: Digital System Design 18S, 20S
Teaching Assistant, Purdue, ECE 362: Microprocessor Systems and Interfacing 19S
Teaching Assistant, Purdue, ENGR 131: Transforming Ideas to Innovation I 17F

Public scholarships

Writings
"From Control to Data to Value: A Third Axis of Parallelism", SIGARCH Computer Architecture Today blog 2026