

Zhouzhuo Guo

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Education

B.S. in Communication Engineering (Weighted average: 82.4/100, GPA: 3.32/4.0)

09/2021–06/2025

Beijing Jiaotong University (BJTU), Beijing, China

Core courses: Analog Electronics Technology; Digital Electronic Technology; Digital Signal Processing; Data Structures; Semiconductor Physics

Research Interests

- Energy-efficient AI chip design from architecture to circuit
- Hardware modeling

Research Experience

Energy-efficient Acceleration System on Chip for Generative AI

2025 summer

Duke University, Durham, USA | Module leader | Energy-efficient AI chips; Hardware modeling

Supervised by Dr. Changchun Zhou

Built an agile hardware modeling framework to evaluate power, performance, and area (PPA) of AI chips with the following three key features:

- **Accurate:** Per-cycle behavior at each clock rising edge; instantaneous counters for EMA/utilization/power/energy.
- **Complete:** Covering interfaces, NoC, and memory management (allocate/release/conflict).
- **Scalable (Diffusion):** Adjustable speed, e.g., 1 cycle/step with ~6 h for cycle-level accuracy, and 100 cycles/step with only 10 min and < 10% deviation for fast profiling.

Wireless Communications Research

2023–2024

Beijing Jiaotong University, Beijing, China | Project leader | Electromagnetic information theory; XL-/CAP-MIMO

Supervised by Prof. Jiayi Zhang and Prof. Cheng Li

- Multi-user XL-MIMO: Derived mutual information expressions under interference/noise; effects of discrete sampling.
- Non-paraxial CAP-MIMO: Tractable MI via dyadic Green's functions; impacts of azimuth, sampling density, and receiver motion.
- Graduation project: Virtualized 5G network planning on Linge platform for cross-regional connected-vehicle scenarios.

Publications

- **Zhouzhuo Guo**[†], Yin Zhang[†], Zhe Wang, Bokai Xu, Huahua Xiao, “Research on Mutual Information for Multi-user Extremely Large-scale MIMO Systems Based on Electromagnetic Information Theory,” *Radio Communications Technology*, 2023. Chinese-core indexed journal. Co-first author († equal contribution).
- Yin Zhang[†], **Zhouzhuo Guo**[†], Bokai Xu, Jiayi Zhang, Huahua Xiao, Wei E. I. Sha, Bo Ai, “Performance Analysis of Non-Paraxial Deployments: Continuous Aperture MIMO for Electromagnetic Information Theory,” *Electromagnetic Science*, Accepted (to appear), 2025. Co-first author († equal contribution).
- Yuzhou Wu, **Zhouzhuo Guo**, Yuntian Liu, Changchun Zhou, “CrimNet: Two-Stage Crime Detection Networks Enhanced by Auxiliary Heads,” *Under review*, 2025.
- **Zhouzhuo Guo**, Changchun Zhou, “Horologium: A Scalable Cycle-Accurate Modeling Framework for AI Accelerators,” *In preparation*

Honors & Awards

National-level Grant (School of Electronic & Information Engineering: 1st place)

2024

BJTU Undergraduate Innovation & Entrepreneurship Program, nominated to the 18th National Undergraduate Innovation & Entrepreneurship Annual Conference (Paper Track), pending.

Silver Award

2024

“Challenge Cup” Undergraduate Entrepreneurship Training Project, Beijing Jiaotong University.

Skills

Languages: Python, C, Verilog

Tools: MATLAB, Git/GitHub, LaTeX, Linux