

# JIAQI GU

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Ph.D. ◊ Department of Electrical, Computer and Energy Engineering

## RESEARCH INTERESTS

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Emerging Hardware for High-Performance, Efficient Computing

- Efficient AI hardware design
- Electronic-photonic mixed-signal computing platform design

Efficient Algorithm, Co-Design & Automation

- Hardware-software co-design & automation (for photonics, post-CMOS electronics, quantum)
- Efficient ML model/algorithm
- AI/ML for hardware design & electronic-photonic design automation

## EDUCATION

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**The University of Texas at Austin, TX, USA**

*Aug. 2018 – May 2023*

Ph.D. Candidate, Department of Electrical and Computer Engineering

Advisor: David Z. Pan

Co-advisor: Ray T. Chen

(GPA 4.0/4.0)

**Fudan University, Shanghai, China**

*Sep. 2014 – Jun. 2018*

B.E., Department of Microelectronic Science and Engineering

(GPA: 3.91/4.0)

(Rank top 2/71)

## AWARDS AND HONORS

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Graduate School Outstanding Dissertation Award	UT Austin	2024
3rd Place at DAC Ph.D. Forum	DAC	2023
MLSys Student Travel Award	MLSys	2023
Margarida Jacome Dissertation Prize	UT Austin	2023
<b>Winner</b> at Robert S. Hilbert Memorial Optical Design Competition	Synopsys	2022
<b>Donald O. Pederson Best Paper Award</b>	IEEE TCAD	2021
Cockrell School Graduate Student Fellowship	UT Austin	2021
<b>First Place</b> at ACM Student Research Competition Grand Finals	ACM	2021
<b>Best Poster Award</b> at NSF Workshop on Machine Learning Hardware	NSF Workshop	2020
<b>First Place</b> at ACM/SIGDA Student Research Competition	ACM/SIGDA	2020
7th Place at IWLS Contest on Machine Learning+Logic Synthesis	IWLS	2020
DAC Young Fellow	DAC	2020,2021
<b>Best Paper Finalist</b> (1 out of 6)	DAC	2020
<b>Best Paper Award</b>	ASP-DAC	2020
4th Place, System Design Contest on Low Power Object Detection	DAC-SDC	2019
First Prize Scholarship	Fudan University	2017–2018
2nd & 3rd Prize, National Mathematical Contest in Modeling	Fudan University	2016–2017

## PROFESSIONAL EXPERIENCE

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### Arizona State University, AZ, USA

*Aug 2023 – Present*

Assistant Professor, School of Electrical, Computer and Energy Engineering

- Director of the Co-design, Automation, and Optimization across System, Technology, and Intelligence Lab ([ScopeX](#)) at ASU.

### Nvidia Inc., CA, USA

*May 2022 – Oct 2022*

Research Intern, ASIC & VLSI Research Team

- Hardware-efficient Transformer compression for natural language processing

### Meta Platforms Inc., CA, USA

*May 2021 – Dec 2021*

Research Intern, Meta reality labs, FAST AI team

- Efficient multi-scale Vision Transformer design for high-performance computer vision

## SELECTED RESEARCH PROJECTS

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### Emerging Hardware for Efficient Computing

Open-source library for photonic AI computing: <https://github.com/JeremieMelo/pytorch-onn> [J10]

Contribute to library for quantum machine learning: <https://github.com/mit-han-lab/torchquantum>

Electronic-photonic NN accelerator [J14]–[J12], [J7], [C52], [C42], [C16], [C9], [C5], [C2]

Photonic in-memory computing [J11], [C24]

### Co-Design & Optimization for Emerging Hardware

Reliability and efficiency-driven model-circuit co-optimization flow [J13], [J57], [C34], [C27], [C5], [C1]

Machine learning-enabled hardware simulation, performance prediction, and design [C45], [C37], [C33]

Automated circuit/architecture design [C34], [C26], [C25]

Efficient on-chip/on-device training for self-learnable AI hardware [C28], [C23], [C18], [C11], [C10]

## PROFESSIONAL SERVICE

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### Co-Chair

- OpenCircuits Workshop at ASPLOS, 2024.

### Organizer

- Optical/Photonic Computing System (OPTSys) Seminar Series, 2023.

### Working Group Member

- NSF AI Institute TILOS Ethics and Early Career Development, 2022.

### Local Arrangement Co-Chair

- IEEE CASS Seasonal School: AI/ML for IC Design and EDA, 2022.

### Technical Program Committee Member

- International Joint Conference on Artificial Intelligence (IJCAI), 2024
- ACM/IEEE Design Automation Conference (DAC), 2024
- IEEE/ACM International Conference on Computer-Aided Design (ICCAD), 2023, 2024
- IEEE International Conference on Computer Design (ICCD), 2023, 2024
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2023
- Association for the Advancement of Artificial Intelligence (AAAI), 2023, 2025

### Reviewer

- IEEE Transaction on Computer-Aided Design of Integrated Circuits and Systems (TCAD)
- ACM Transactions on Design Automation of Electronic Systems (TODAES)
- ACM/IEEE Design Automation Conference (DAC)

- IEEE/ACM International Conference on Computer-Aided Design (ICCAD)
- IEEE Computer Society Annual Symposium on VLSI (ISVLSI)
- IEEE International Conference on Computer Design (ICCD)
- ACM Great Lakes Symposium on VLSI (GLSVLSI)
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Learning Representations (ICLR)
- International Conference on Machine Learning (ICML)
- IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR)
- International Conference on Computer Vision (ICCV)
- European Conference on Computer Vision (ECCV)
- Association for the Advancement of Artificial Intelligence (AAAI)
- International Conference on Intelligent Robots and Systems (IROS)
- Nature Communications (Nat. Commun.)
- Science Advances (Sci. Adv.)
- IEEE Journal of Selected Topics in Quantum Electronics (JSTQE)
- Applied Physics Letters (APL)
- IEEE Photonics Technology Letters (PTL)

## TEACHING

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Teaching Assistant (UT Austin)	EE382M: VLSI Physical Design Automation	Spring 2022
Instructor (ASU)	EEE425/591: Digital Systems and Circuits	Fall 2023
Instructor (ASU)	EEE525: VLSI Design	Spring 2024
Instructor (ASU)	EEE598: Algorithm/Hardware Co-Design and Design Automation for Emerging AI Hardware	Fall 2024

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## INVITED TALKS

- “Cross-Layer Hardware / Algorithm Co-Design and Design Automation for Photonic AI Computing Systems,” [Open Compute Project Future Technologies Initiative, AI HW-SW CoDesign](#), Invited Talk, online, May. 17, 2024.
- “Cross-Layer Hardware / Software Co-Design and Design Automation for Photonic AI Computing Systems,” [OpenCircuit Workshop at ASPLOS](#), Invited Talk, Apr. 27, 2024.
- “Bridging Photonics and AI via Cross-Layer Hardware / Software Co-Design and Intelligent Design Automation,” Online Guest Lecture at Optimization and Machine Learning in VLSI Design Automation Course, Peking University, online, Dec. 12, 2023.
- “[Light-AI Interaction: Bridging Photonics and Artificial Intelligence via Cross-Layer Hardware/Software Co-Design](#),” Rutgers Efficient AI (REFAI) Seminar, online, Dec. 5, 2023.
- “[Light-AI Interaction: Bridging Photonics and Artificial Intelligence via Cross-Layer Hardware/Software Co-Design](#),” Photonics & Advanced Intelligent Systems Workshop (PAIS), online, Dec. 1, 2023.
- “[Tutorial: A Journey to Optical Computing: From Physics Fundamentals to Hardware-Software Co-Design, Automation, and Application](#),” IEEE/ACM Design Automation Conference (DAC) Tutorial, San Francisco, Jul. 10, 2023.
- “Light-AI Interaction: The Convergence of Photonic AI and Cross-layer Circuit-Architecture-Algorithm Co-design,” SPIE Photonics West Invited Talk, San Francisco, Feb. 1, 2023
- “Light-AI Interaction: Bridging Photonics and Artificial Intelligence via Cross-Layer Circuit-Architecture-Algorithm Co-Design,” LSIP Tech Talk, Hewlett Packard Labs, Dec. 16, 2022

- “Light-AI Interaction: The Convergence of Photonic Deep Learning and Cross-Layer Design Automation,” ACCESS and CEDA Joint Seminar, Hong Kong, July 29, 2022
- “NeurOLight: A Physics-Agnostic Neural Operator Enabling Parametric Photonic Device Simulation,” Nvidia AI Research, Oct. 12, 2022
- “L2ight: Enabling On-Chip Learning for Optical Neural Networks via Efficient in-situ Subspace Optimization,” Cornell Univ., Jan. 19, 2022

## PUBLICATIONS

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### Journal Papers

- [J18] Zhengqi Gao, **Jiaqi Gu**, Zhengxing Zhang, David Z. Pan, and Duane S. Boning, “Selecting robust silicon photonic designs after Bayesian optimization without extra simulations,” *Optics Express (OE)*, Sep. 2024. (**Editor’s Pick**)
- [J17] Shupeng Ning, Hanqing Zhu, Chenghao Feng, **Jiaqi Gu**, Zhixing Jiang, Zhoufeng Ying, Jason Midkiff, Sourabh Jain, May H. Hlaing, David Z. Pan, and Ray T. Chen, “Photonic-Electronic Integrated Circuits for High-Performance Computing and AI Accelerator,” *IEEE Journal of Lightwave Technology (JLT)*, Jul. 2024.
- [J16] Haotian Lu, Sanmitra Banerjee, and **Jiaqi Gu**, “DOCTOR: Dynamic On-Chip Temporal Variation Remediation Toward Self-Corrected Photonic Tensor Accelerators,” *IEEE Journal of Lightwave Technology (JLT)*, Jun. 2024.
- [J15] Meng Zhang\*, Dennis Yin\*, Nicholas Gangi, Amir Begović, Alexander Chen, Zhaoran Rena Huang, and **Jiaqi Gu**, “TeMPO: Efficient Time-Multiplexed Dynamic Photonic Tensor Core for Edge AI with Compact Slow-Light Electro-Optic Modulator,” *Journal of Applied Physics (JAP)*, Jun. 2024. (\*Equal Contribution)
- [J14] Chenghao Feng, **Jiaqi Gu**, Hanqing Zhu, Rongxing Tang, Shupeng Ning, May Hlaing, Jason Midkiff, Sourabh Jain, David Z. Pan, and Ray T. Chen, “Integrated Multi-Operand Optical Neurons for Scalable and Hardware-Efficient Deep Learning,” *Nanophotonics*, Dec. 2023.
- [J13] Chenghao Feng\*, **Jiaqi Gu\***, Hanqing Zhu, Zhoufeng Ying, Zheng Zhao, David Z. Pan, and Ray T. Chen, “A compact butterfly-style silicon photonic-electronic neural chip for hardware-efficient deep learning,” *ACS Photonics*, Nov. 2022. (\*Equal Contribution)
- [J12] **Jiaqi Gu**, Chenghao Feng, Hanqing Zhu, Zheng Zhao, Zhoufeng Ying, Mingjie Liu, Ray T. Chen, and David Z. Pan, “SqueezeLight: A Multi-Operand Ring-Based Optical Neural Network with Cross-Layer Scalability,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, Jul. 2022.
- [J11] Hanqing Zhu, **Jiaqi Gu**, Chenghao Feng, Mingjie Liu, Zixuan Jiang, Ray T. Chen, and David Z. Pan, “ELight: Towards Efficient and Aging-Resilient Photonic In-Memory Neurocomputing,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, Jun. 2022.
- [J10] **Jiaqi Gu**, Chenghao Feng, Hanqing Zhu, Ray T. Chen, and David Z. Pan, “Light in AI: Toward Efficient Neurocomputing with Optical Neural Networks - A Tutorial,” *IEEE Transactions on Circuits and Systems–II: Express Briefs (TCAS-II)*, Apr. 2022.
- [J9] Chenghao Feng, Zhoufeng Ying, Zheng Zhao, **Jiaqi Gu**, David Z. Pan, and Ray T. Chen, “Towards high-speed and energy-efficient computing: A WDM-based scalable on-chip silicon integrated optical comparator,” *Laser & Photonics Reviews*, Jun. 2021.
- [J8] Zhoufeng Ying, Chenghao Feng, Zheng Zhao, **Jiaqi Gu**, Richard Soref, David Z. Pan, and Ray T. Chen, “Sequential logic and pipelining in chip-based electronic-photonic digital computing,” *IEEE Photonics Journal*, Oct. 2020.
- [J7] **Jiaqi Gu**, Zheng Zhao, Chenghao Feng, Zhoufeng Ying, Mingjie Liu, Ray T. Chen, and David Z. Pan, “Towards Hardware-Efficient Optical Neural Networks: Beyond FFT Architecture via Joint Learnability,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2020.
- [J6] Chenghao Feng, Zhoufeng Ying, Zheng Zhao, **Jiaqi Gu**, Ray T. Chen, and David Z. Pan, “Wavelength-division-multiplexing (WDM)-based integrated electronic-photonic switching network (EPSN) for high-speed data processing and transportation,” *Nanophotonics*, Aug. 2020.

- [J5] Yibo Lin, Zixuan Jiang, **Jiaqi Gu**, Wuxi Li, Shounak Dhar, Haoxing Ren, Brucek Khailany, and David Z. Pan, “[DREAMPlace: Deep Learning Toolkit-Enabled GPU Acceleration for Modern VLSI Placement](#),” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, Jun. 2020. (**Best Paper Award**)
- [J4] Zhoufeng Ying, Chenghao Feng, Zheng Zhao, Shounak Dhar, Hamed Dalir, **Jiaqi Gu**, Yue Cheng, Richard Soref, David Z. Pan, and Ray T. Chen, “[Electronic-photonic Arithmetic Logic Unit for High-speed Computing](#),” *Nature Communications*, Apr. 2020.
- [J3] Yibo Lin, Wuxi Li, **Jiaqi Gu**, Mark Ren, Brucek Khailany, and David Z. Pan, “[ABCDPlace: Accelerated Batch-based Concurrent Detailed Placement on Multi-threaded CPUs and GPUs](#),” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, Feb. 2020.
- [J2] Ruoyao Wang, Zhenghan Fang, **Jiaqi Gu**, Yi Guo, Shicong Zhou, Yuanyuan Wang, Cai Chang, and Jinhua Yu, “[High-resolution Image Reconstruction for Portable Ultrasound Imaging Devices](#),” *EURASIP Journal on Advances in Signal Processing*, Dec. 2019.
- [J1] **Jiaqi Gu**, Zeju Li, Yuanyuan Wang, Haowei Yang, Zhongwei Qiao, and Jinhua Yu, “[Deep Generative Adversarial Networks for Thin-section Infant MR Image Reconstruction](#),” *IEEE Access*, May 2019.

## Refereed Conference Papers

- [C63] Pingchuan Ma, Zhengqi Gao, Amir Begovic, Meng Zhang, Haoyu Yang, Haoxing Ren, Rena Huang, Duane S. Boning, and **Jiaqi Gu**, “[BOSON<sup>-1</sup>: Understanding and Enabling Physically-Robust Photonic Inverse Design with Adaptive Variation-Aware Subspace Optimization](#),” *IEEE/ACM Proceedings Design, Automation and Test in Europe (DATE)*, Mar. 2025.
- [C62] Junyao Zhang, Guanglei Zhou, Feng Cheng, Jonathan Hao-Cheng Ku, Qi Ding, **Jiaqi Gu**, Hanrui Wang, Hai (Helen) Li, and Yiran Chen, “[qGDP: Quantum Legalization and Detailed Placement for Superconducting Quantum Computers](#),” *IEEE/ACM Proceedings Design, Automation and Test in Europe (DATE)*, Mar. 2025.
- [C61] Hongjian Zhou, Keren Zhu, and Jiaqi Gu, “[APR: Automated Photonic Integrated Circuit Detailed Routing with Curvy Waveguide and Adaptive Crossing Insertion](#),” *ACM International Symposium on Physical Design (ISPD)*, Mar. 2025.
- [C60] Haotian Lu, Ziang Yin, Partho Bhoumik, Sanmitra Banerjee, Krishnendu Chakrabarty, and **Jiaqi Gu**, “[The Unlikely Hero: Nonidealities in Analog Photonic Neural Networks as Built-in Adversarial Defenders](#),” *IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC)*, Jan. 2025. (Acceptance Rate: 28.62%)
- [C59] Ziyang Jiang, Pingchuan Ma, Meng Zhang, Rena Huang, and **Jiaqi Gu**, “[ADEPT-Z: Zero-Shot Automated Circuit Topology Search for Pareto-Optimal Photonic Tensor Cores](#),” *IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC)*, Jan. 2025. (Acceptance Rate: 28.62%)
- [C58] Ziang Yin, Nicholas Gangi, Meng Zhang, Jeff Zhang, Rena Huang, and **Jiaqi Gu**, “[SCATTER: Algorithm-Circuit Co-Sparse Photonic Accelerator with Thermal-Tolerant, Power-Efficient In-situ Light Redistribution](#),” *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, Jun. 2024. (Acceptance Rate: 24%)
- [C57] Hanrui Wang, Pengyu Liu, Bochen Tan, Yilian Liu, **Jiaqi Gu**, David Z. Pan, Jason Cong, Umut Acar, and Song Han, “[FPQA-C: A Compilation Framework for Field Programmable Qubit Array](#),” *IEEE/ACM International Symposium on Computer Architecture (ISCA)*, Jun. 2024.
- [C56] Hanrui Wang, Bochen Tan, Pengyu Liu, Yilian Liu, **Jiaqi Gu**, Jason Cong, and Song Han, “[Q-Pilot: Field Programmable Quantum Array Compilation with Flying Ancillas](#),” *ACM/IEEE Design Automation Conference (DAC)*, Jun. 2024. (Acceptance Rate: 25%)
- [C55] Meng Zhang, Amir Begović, Dennis Yin, Nicholas Gangi, **Jiaqi Gu**, and Rena Huang, “[Foundry Manufactured 6-bit Resolution, 150um Long SlowLight Electro-Optic Modulator for On-Chip Photonic Tensor Computing](#),” *Conference on Lasers and Electro-Optics*, May 2024. (Accepted)
- [C54] Shupeng Ning, Hanqing Zhu, Chenghao Feng, Christian Uselton, **Jiaqi Gu**, Rongxing Tang, David Z. Pan, and R. T. Chen, “[Realization of a Compact Photoelectric Platform for Optical Convolution Processing](#),” *Conference on Lasers and Electro-Optics*, May 2024. (Accepted)
- [C53] Chun-Ju Yang, Hanqing Zhu, Shupeng Ning, Chenghao Feng, **Jiaqi Gu**, David Z. Pan, and Ray T. Chen, “[Deep Learning Enhanced Early Detection of Pancreatic Cancer Using Integrated Photonic Chip Based Optical Neural Networks](#),” *Conference on Lasers and Electro-Optics*, May 2024. (Accepted)



- [C52] Hanqing Zhu, **Jiaqi Gu**, Hanrui Wang, Rongxing Tang, Zhekai Zhang, Chenghao Feng, Song Han, Ray T. Chen, and David Z. Pan, “[Lightening-Transformer: A Dynamically-operated Optically-interconnected Photonic Transformer Accelerator](#),” *IEEE International Symposium on High Performance Computer Architecture (HPCA)*, Mar. 2024.
- [C51] Shupeng Ning, **Jiaqi Gu**, Chenghao Feng, Rongxing Tang, Hanqing Zhu, David Z. Pan, and Ray T. Chen, “[A Hardware-Efficient Silicon Electronic-Photonic Chip for Optical Structured Neural Networks](#),” *SPIE Photonics West*, Jan. 2024.
- [C50] Zixuan Jiang, **Jiaqi Gu**, Hanqing Zhu, and David Z. Pan, “[Pre-RMSNorm and Pre-CRMSNorm Transformers: Equivalent and Efficient Pre-LN Transformers](#),” *Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2023. (**Spotlight**) (Acceptance Rate: 26.1%)
- [C49] **Jiaqi Gu**, Mohit Dighamber, Zhengqi Gao, and Duane S Boning, “[Benchmarking the robustness of neural network-based partial differential equation solvers](#),” *ICCAD Fast Machine Learning for Science Workshop*, 2023.
- [C48] Shanny Lin, Steven Clayton, Chenghao Feng, **Jiaqi Gu**, Christopher Morris, Maninder Singh, Hanqing Zhu, David Z. Pan, Ray T. Chen, and Zhehui Wang, “[Deep learning for neutron lifetime measurement](#),” *Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan*, 2023.
- [C47] Tianlong Chen, Zhenyu Zhang, Hanrui Wang, **Jiaqi Gu**, Zirui Li, David Z. Pan, Frederic Chong, Song Han, and Zhangyang Wang, “[QuantumSEA: In-Time Sparse Exploration for Noise Adaptive Quantum Circuits](#),” *International Conference on Quantum Computing and Engineering (QCE)*, Sep. 2023.
- [C46] Chenghao Feng, Shupeng Ning, **Jiaqi Gu**, Hanqing Zhu, David Z. Pan, and Ray T. Chen, “[Integrated Photonics for Computing and Artificial Intelligence](#),” *IEEE Photonics Society Summer Topicals Meeting Series (SUM)*, Jul. 2023.
- [C45] **Jiaqi Gu**, Hanqing Zhu, Chenghao Feng, Zixuan Jiang, Ray T. Chen, and David Z. Pan, “[M<sup>3</sup>ICRO: Machine Learning-Enabled Compact Photonic Tensor Core based on PRogrammable Multi-Operand Multimode Interference](#),” *arXiv preprint arXiv:2305.19505*, Jun. 2023.
- [C44] Zixuan Jiang, **Jiaqi Gu**, and David Pan, “[NormSoftmax: Normalizing the Input of Softmax to Accelerate and Stabilize Training](#),” *IEEE International Conference on Omni Layer Intelligent Systems (COINS)*, Jul. 2023.
- [C43] Zixuan Jiang, **Jiaqi Gu**, Mingjie Liu, and David Pan, “[Delving into Effective Gradient Matching for Dataset Condensation](#),” *IEEE International Conference on Omni Layer Intelligent Systems (COINS)*, Jul. 2023.
- [C42] Hanqing Zhu, **Jiaqi Gu**, Hanrui Wang, Rongxing Tang, Zhekai Zhang, Chenghao Feng, Song Han, Ray T. Chen, and David Z. Pan, “[DOTA: A Dynamically-Operated Photonic Tensor Core for Energy-Efficient Transformer Accelerator](#),” *Conference on Machine Learning and Systems (MLSys) Systems for Next-Gen AI Paradigms (SNAP) Workshop*, May 2023.
- [C41] **Jiaqi Gu**, Chenghao Feng, Hanqing Zhu, Ray T. Chen, and David Z. Pan, “Light-AI Interaction: Bridging Photonics and AI with Cross-Layer Hardware-Software Co-Design,” *Conference on Machine Learning and Systems (MLSys) Systems for Next-Gen AI Paradigms (SNAP) Workshop*, May 2023.
- [C40] Chenghao Feng, **Jiaqi Gu**, Hanqing Zhu, Rongxing Tang, David Z. Pan, and Ray T. Chen, “[Evaluation of a compact butterfly-style photonic-electronic neural chip on complicated deep learning tasks](#),” *Conference on Lasers and Electro-Optics*, May 2023.
- [C39] **Jiaqi Gu**, Chenghao Feng, Hanqing Zhu, Ray T. Chen, and David Z. Pan, “Light-AI Interaction: The Convergence of Photonic AI and Cross-layer Circuit-Architecture-Algorithm Co-design,” *SPIE Photonics West*, Jan. 2023. (**Invited Paper**)
- [C38] Chenghao Feng, Rongxing Tang, **Jiaqi Gu**, Hanqing Zhu, David Z. Pan, and Ray T. Chen, “Optically-Interconnected, Hardware-Efficient, Electronic-Photonic Neural Network using Compact Multi-Operand Photonic Devices,” *SPIE Photonics West*, Jan. 2023.
- [C37] **Jiaqi Gu**, Zhengqi Gao, Chenghao Feng, Hanqing Zhu, Ray T. Chen, Duane S. Boning, and David Z. Pan, “[NeurOLight: A Physics-Agnostic Neural Operator Enabling Parametric Photonic Device Simulation](#),” *Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2022. (**Spotlight**) (Acceptance Rate: 25.6%)
- [C36] **Jiaqi Gu**, Ben Keller, Jean Kossaifi, Anima Anandkumar, Brucek Khailany, and David Z. Pan, “[HEAT: Hardware-Efficient Automatic Tensor Decomposition for Transformer Compression](#),” *Conference on Neural Information Processing Systems (NeurIPS), ML for System Workshop (MLSys)*, Dec. 2022. (**Spotlight**)

- [C35] Wei Shi, Hanrui Wang, **Jiaqi Gu**, Mingjie Liu, David Pan, Song Han, and Nan Sun, “[RobustAnalog: Fast Variation-Aware Analog Circuit Design Via Multi-task RL](#),” *ACM/IEEE Workshop on Machine Learning for CAD (MLCAD)*, Aug. 2022.
- [C34] Hanqing Zhu, Keren Zhu, **Jiaqi Gu**, Harrison Jin, Ray T.Chen, Jean Anne Incorvia, and David Z. Pan, “[Fuse and Mix: MACAM-Enabled Analog Activation for Energy-Efficient Neural Acceleration](#),” *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, Jul. 2022. (Acceptance Rate: 23.5%)
- [C33] Hanrui Wang, Zhiding Liang, **Jiaqi Gu**, Zirui Li, Yongshan Ding, Weiwen Jiang, Yiyu Shi, David Z. Pan, Frederic T. Chong, and Song Han, “[TorchQuantum Case Study for Robust Quantum Circuits](#),” *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, Jul. 2022. (**Invited Paper**)
- [C32] Chenghao Feng, **Jiaqi Gu**, Hanqing Zhu, Zhoufeng Ying, Zheng Zhao, David Z. Pan, and Ray T. Chen, “[Optoelectronically Interconnected Hardware-Efficient Deep Learning using Silicon Photonic Chips](#),” *Conference on Lasers and Electro-Optics*, Mar. 2022.
- [C31] Chenghao Feng, **Jiaqi Gu**, Hanqing Zhu, David Z. Pan, and Ray T. Chen, “[Design and Experimental Demonstration of A Hardware-Efficient Integrated Optical Neural Network](#),” *Conference on Lasers and Electro-Optics*, Mar. 2022.
- [C30] **Jiaqi Gu**, Hyoukjun Kwon, Dilin Wang, Wei Ye, Meng Li, Yu-Hsin Chen, Liangzhen Lai, Vikas Chandra, and David Z. Pan, “[Multi-Scale High-Resolution Vision Transformer for Semantic Segmentation](#),” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022. (Acceptance Rate: 25.3%)
- [C29] **Jiaqi Gu**, Hanqing Zhu, Chenghao Feng, Zixuan Jiang, Mingjie Liu, Shuhan Zhang, Ray T. Chen, and David Z. Pan, “[ADEPT: Automatic Differentiable DEsign of Photonic Tensor Cores](#),” *ACM/IEEE Design Automation Conference (DAC)*, Jul. 2022. (**Best-in-Track Paper**) (Acceptance Rate: 23%)
- [C28] Hanrui Wang, Zirui Li, **Jiaqi Gu**, Yongshan Ding, David Z. Pan, and Song Han, “[QOC: Quantum On-Chip Training with Parameter Shift and Gradient Pruning](#),” *ACM/IEEE Design Automation Conference (DAC)*, Jul. 2022. (Acceptance Rate: 23%)
- [C27] Hanrui Wang, **Jiaqi Gu**, Yongshan Ding, Zirui Li, Frederic T. Chong, David Z. Pan, and Song Han, “[QuantumNAT: Quantum Noise-Aware Training with Noise Injection, Quantization and Normalization](#),” *ACM/IEEE Design Automation Conference (DAC)*, Jul. 2022. (Acceptance Rate: 23%)
- [C26] Zizheng Guo, Mingjie Liu, **Jiaqi Gu**, Shuhan Zhang, David Z. Pan, and Yibo Lin, “[A Timing Engine Inspired Graph Neural Network Model for Pre-Routing Slack Prediction](#),” *ACM/IEEE Design Automation Conference (DAC)*, Jul. 2022. (**Best-in-Track Paper**) (Acceptance Rate: 23%)
- [C25] Hanrui Wang, Yongshan Ding, **Jiaqi Gu**, Yujun Lin, David Z. Pan, Frederic T. Chong, and Song Han, “[QuantumNAS: Noise-Adaptive Search for Robust Quantum Circuits](#),” *IEEE International Symposium on High Performance Computer Architecture (HPCA)*, Feb. 2022. (Acceptance Rate: 29%)
- [C24] Hanqing Zhu, **Jiaqi Gu**, Chenghao Feng, Mingjie Liu, Zixuan Jiang, Ray T. Chen, and David Z. Pan, “[ELight: Enabling Efficient Photonic In-Memory Neurocomputing with Life Enhancement](#),” *IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC)*, Jan. 2022.
- [C23] **Jiaqi Gu**, Hanqing Zhu, Chenghao Feng, Zixuan Jiang, Ray T. Chen, and David Z. Pan, “[L2ight: Enabling On-Chip Learning for Optical Neural Networks via Efficient in-situ Subspace Optimization](#),” *Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2021. (Acceptance Rate: 22.7%)
- [C22] **Jiaqi Gu**, Hanqing Zhu, Chenghao Feng, Mingjie Liu, Zixuan Jiang, Ray T. Chen, and David Z. Pan, “[Towards Memory-Efficient Neural Networks via Multi-Level in situ Generation](#),” *International Conference on Computer Vision (ICCV)*, Oct. 2021. (Acceptance Rate: 25.9%)
- [C21] Zixuan Jiang, **Jiaqi Gu**, Mingjie Liu, Keren Zhu, and David Z. Pan, “[Optimizer Fusion: Efficient Training with Better Locality and Parallelism](#),” *International Conference on Learning Representations (ICLR) Workshop, Hardware Aware Efficient Training (HAET)*, May 2021. (Acceptance Rate: 28.7%)
- [C20] Chenghao Feng, **Jiaqi Gu**, Hanqing Zhu, David Z. Pan, and Ray T. Chen, “[Experimental Demonstration of a WDM-based Integrated Optical Decoder for Compact Optical Computing](#),” *Conference on Lasers and Electro-Optics*, May 2021.
- [C19] Jason Midkiff, Ali Rostamian, Kyoung Min Yoo, Aref Asghari, Chao Wang, Chenghao Feng, Zhoufeng Ying, **Jiaqi Gu**, Haixia Mei, Ching-Wen Chang, James Fang, Alan Huang, Jong-Dug Shin, Xiaochuan Xu, Michael Bukshtab, David Z. Pan, and Ray T. Chen, “[Integrated Photonics for Computing, Interconnects and Sensing](#),” *Conference on Lasers and Electro-Optics*, May 2021. (**Invited Paper**)

- [C18] **Jiaqi Gu**, Chenghao Feng, Zheng Zhao, Zhoufeng Ying, Ray T. Chen, and David Z. Pan, “Efficient On-Chip Learning for Optical Neural Networks Through Power-Aware Sparse Zeroth-Order Optimization,” *Association for the Advancement of Artificial Intelligence (AAAI)*, Feb. 2021. (Acceptance Rate: 21%)
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