Yao Lai

laiyao1.me

Email : yl2204@cam.ac.uk
Mobile : +44-7950049487

Education

- **The University of Hong Kong (QS rank: 11)** — Hong Kong S.A.R.
  Ph.D. in Computer Science; HKU-MMLab; Advisor: Prof. Ping Luo — *Sep. 2021 – Nov. 2025*
- **Tsinghua University (QS rank: 17)** — Beijing, China
  M.Eng. in Software Engineering; GPA: 3.84/4.00; Rank: 1/98; Advisor: Prof. Xiaojun Ye — *Sep. 2017 – Jun. 2020*
- **Fudan University (QS rank: 30)** — Shanghai, China
  B.Eng. in Microelectronics; GPA: 3.87/4.00; Rank: 2/69; Advisor: Prof. Xuan Zeng, Prof. Minge Jing — *Sep. 2013 – Jun. 2017*

Research Experience

- **University of Cambridge (QS rank: 6)** — Cambridge, United Kingdom
  Postdoctoral Research Associate; Advisors: Prof. Robert Mullins, Prof. Timothy M. Jones — *Dec. 2025 – Present*
- **The University of Texas at Austin (QS rank: 68)** — Austin, Texas, United States
  Research Scholar; UTDA Lab; Advisor: Prof. David Z. Pan (IEEE/ACM Fellow) — *Feb. 2024 – Jul. 2024*

Award

- **Electronics Best PhD Thesis Award** *2026*
- **NeurIPS Scholar Award** *2024*
- **Best Oral Presentation of Westlake Future Scholars Forum** *2023*
- **Outstanding Graduates of Software School, Tsinghua University** *2020*
- **Excellent undergraduate thesis of Fudan University** *(Top 1 of 69)* *2017*
- **Shanghai Outstanding Graduates** *(Top 5%)* *2017*

Scholarship

- **Hong Kong PhD Fellowship** *2021 – 2025*
- **HKU Presidential PhD Scholar** *2021 – 2025*
- **Shanghai Scholarship** *(Top 3%)* *2016*
- **National Scholarship** *(Top 1 of 69)* *2015*
- **Freshman Scholarship of Fudan University** *(Top 5%)* *2013*

Publications

- **Analog IC Design**
  - [1] **Yao Lai**, Souradip Poddar, Sungyoung Lee, Guojin Chen, Mengkang Hu, Bei Yu, Ping Luo, David Z. Pan. "AnalogCoder-Pro: Unifying Analog Circuit Generation and Optimization via Multi-modal LLMs." IEEE Transactions on Computer-Aided Design of Integrated Circuits & Systems (TCAD), 2025. **CCF-A**
  - [2] **Yao Lai**, Sungyoung Lee, Guojin Chen, Souradip Poddar, Mengkang Hu, David Z. Pan, Ping Luo. "AnalogCoder: Analog Circuit Design via Training-Free Code Generation." AAAI Conference on Artificial Intelligence (AAAI) **oral** (Top 5%), 2025.
    CCF-A **100+ citations** **Most Influential 2025 AAAI Papers (Paper Digest)**
  - [3] Souradip Poddar, Youngmin Oh, **Yao Lai**, Hanqing Zhu, Bosun Hwang, David Z Pan. "INSIGHT: Universal Neural Simulator for Analog Circuits Harnessing Autoregressive Transformers." Design Automation Conference (DAC), 2025. **CCF-A**
- **Physical Design**
  - [4] **Yao Lai**, Jinxin Liu, Zhentao Tang, Wang Bin, Jianye Hao, Ping Luo. "ChiPFormer: Transferable Chip Placement via Offline Decision Transformer." International Conference on Machine Learning (ICML), 2023.
    CCF-A **100+ citations**
  - [5] **Yao Lai**, Yao Mu, Ping Luo. "MaskPlace: Fast Chip Placement via Reinforced Visual Representation Learning." Advances in Neural Information Processing Systems (NeurIPS) **spotlight**, 2022. **CCF-A** **100+ citations**
  - [6] Guojin Chen, Keren Zhu, Seunggeun Kim, Hanqing Zhu, **Yao Lai**, Bei Yu, David Z. Pan. "LLM-Enhanced Bayesian Optimization for Efficient Analog Layout Constraint Generation." arXiv, 2024.

- [7] Yunqi Shi, Xi Lin, Zhiang Wang, Siyuan Xu, Shixiong Kai, **Yao Lai**, Chengrui Gao, Ke Xue, Mingxuan Yuan, Chao Qian, Zhi-Hua Zhou. "Re^{2}MaP: Macro Placement by Recursively Prototyping and Packing Tree-based Relocating." IEEE Transactions on Computer-Aided Design of Integrated Circuits & Systems (TCAD), 2026. **CCF-A**
- [8] **Yao Lai**, Ming'e Jing. "On-chip Network Source Routing Algorithm Based on A* Algorithm Optimization." Journal of Fudan University, 2018. (in Chinese)

- **Logic Design & Computer Arithmetic**
  - [9] **Yao Lai**, Jinxin Liu, David Z. Pan, Ping Luo. "Scalable and Effective Arithmetic Tree Generation for Adder and Multiplier Designs." Advances in Neural Information Processing Systems (NeurIPS) **spotlight** (Top 2%), 2024. **CCF-A**
  - [10] Jing Wang, Zheng Li, Lei Li, Fan He, Liyu Lin, **Yao Lai**, Yan Li, Xiaoyang Zeng, Yufeng Guo. "Principle-Guided Verilog Optimization: IP-Safe Knowledge Transfer via Local-Cloud Collaboration." arXiv, 2025.
- **Circuit Representation & Modeling**
  - [11] Sungyoung Lee, **Yao Lai**, Ziyi Wang, Seunggeun Kim, Taekyun Lee, David Z. Pan. "Dual-Augmentation Graph Contrastive Pretraining for Transistor-level Integrated Circuits." arXiv, 2025.
- **Design for Manufacturing**
  - [12] **Yao Lai**, Xuyuan Xiong, Zeyue Xue, Guojin Chen, Jing Wang, Xihui Liu, Rui Zhang, Robert Mullins, Bei Yu, Ping Luo. "Fast Inverse Lithography via GRPO Reinforced Flow Matching." International Conference on Machine Learning (ICML), 2026. **CCF-A**
- **Multimodal Foundation Models**
  - [13] Jin Wang*, **Yao Lai***, Aoxue Li, Shifeng Zhang, Jiacheng Sun, Ning Kang, Chengyue Wu, Zhenguo Li, Ping Luo. "FUDOKI: Discrete Flow-based Unified Understanding and Generation via Kinetic-Optimal Velocities." Advances in Neural Information Processing Systems (NeurIPS) **spotlight** (Top 2%), 2025. **CCF-A**
- **Computer Architecture**
  - [14] Jiayi Nie, Haoran Wu, **Yao Lai**, Zeyu Cao, Cheng Zhang, Binglei Lou, Erwei Wang, Jianyi Cheng, Timothy M. Jones, Robert Mullins, Rika Antonova, Yiren Zhao. "KernelCraft: Benchmarking for Agentic Close-to-Metal Kernel Generation on Emerging Hardware." International Conference on Machine Learning (ICML), 2026. **CCF-A**
  - [15] Binglei Lou, Haoran Wu, Kevin Lau, Gregor MacDonald, Jiayi Nie, **Yao Lai**, Can Xiao, Xuan Guo, Jianyi Cheng, Rika Antonova, Robert Mullins, Aaron Zhao. "NPU Design for Diffusion Language Model Inference." arXiv, 2026.
  - [16] Haoran Wu, Zeyu Cao, **Yao Lai**, Binglei Lou, Jiayi Nie, Can Xiao, Timi Adeniran, Przemyslaw Forys, Kauser Johar, Catriona Wright, Junyi Liu, Kai Shi, Nicholas D Lane, Rika Antonova, Jianyi Cheng, Timothy Jones, Aaron Zhao, Robert Mullins. "MemExplorer: Navigating the Heterogeneous Memory Design Space for Agentic Inference NPUs." arXiv, 2026.
- **AI for Security and Planning**
  - [17] **Yao Lai**, Guolou Ping, Xiaojun Ye. "OpenSmax: Unknown Domain Generation Algorithm Detection." European Conference on Artificial Intelligence (ECAI), 2020. **CCF-B**
  - [18] Lan Zhang, **Yao Lai**, Xiaojun Ye. "Attention Mechanism Based Detection of Malware Call Sequences." Computer Science, 2019. (in Chinese)
  - [19] Lizheng Deng, Hongyong Yuan, Lida Huang, Shuan Yan, **Yao Lai**. "Post-earthquake Search via an Autonomous UAV: Hybrid Algorithm and 3D Path Planning." IEEE ICNC-FSKD, 2018.

Programming Skills

- **Languages**: C/C++, Python, SQL, Java, Perl, MATLAB, Verilog HDL
- **Tools**: Pytorch, Tensorflow, Scikit-learn

Language Skills

- **English**: **Advanced** TOEFL-iBT: 102
- **Japanese**: **Intermediate** JLPT-N2 (Japanese Language Proficiency Test)
- **Cantonese**: **Intermediate**

Teaching

- Teaching Assistant for *Computer programming II* *2022*
- Teaching Assistant for *Introduction to Database Management Systems* *2022*