

# Jing Mai

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## Bio

I am a second-year Ph.D. student in the Department of Computer Science at Peking University associated with the Center for Energy-Efficient Computing and Applications (CECA). I am a member of the *PKU-IDEA Lab*, advised by Prof. Yibo Lin. Previously, I received the B.S. degree in Computer Science and Technology from Peking University in 2021. My research focuses are machine learning-assisted EDA; my broader interests include MLSys, concurrency and probabilistic modeling.

## Education

### Ph.D. in Computer Science

Center for Energy-efficient Computing and Applications (CECA), Peking University  
Advisor: Prof. Yibo Lin

Sept. 2021 – Present

Beijing, China

### B.S. in Computer Science and Technology

School of Electronics Engineering and Computer Science (EECS), Peking University

Sept. 2017 – June 2021

Beijing, China

## Publications

(\* denotes alphabetical ordering or equal contribution)

### Refereed Conference Papers .....

[C1] **Jing Mai\***, Jiarui Wang\*, Zhixiong Di, Guojie Luo, Yun Liang and Yibo Lin. *OpenPARF: An Open-Source Placement and Routing Framework for Large-Scale Heterogeneous FPGAs with Deep Learning Toolkit*. International Conference on ASIC (**ASICON**), 2023. (**Invited Paper**)

[C2] Jiarui Wang, **Jing Mai**, Zhixiong Di, Yibo Lin. *A Robust FPGA Router with Concurrent Intra-CLB Rerouting*. 28th Asia and South Pacific Design Automation Conference (**ASP-DAC**), 2023.

[C3] Yifan Chen, **Jing Mai**, Xiaohan Gao, Muhan Zhang, Yibo Lin. *MacroRank: Ranking Macro Placement Solutions Leveraging Translation Equivariancy*. 28th Asia and South Pacific Design Automation Conference (**ASP-DAC**), 2023.

[C4] **Jing Mai**, Yibai Meng, Zhixiong Di, Yibo Lin. *Multi-Electrostatic FPGA Placement Considering SLICEL-SLICEM Heterogeneity and Clock Feasibility*. 59th ACM/IEEE Design Automation Conference (**DAC**), 2022.

[C5] **Jing Mai\***, Zizheng Guo\*, Yibo Lin. *Ultrafast CPU/GPU Kernels for Density Accumulation in Placement*. 58th ACM/IEEE Design Automation Conference (**DAC**), 2021.

### Journal Papers .....

[J1] **Jing Mai**, Jiarui Wang, Zhixiong Di, Yibo Lin. *Multi-Electrostatic FPGA Placement Considering SLICEL-SLICEM Heterogeneity, Clock Feasibility, and Timing Optimization*. IEEE Journal of Technology Computer Aided Design (**TCAD**), 2023.

[J2] **Jing Mai\***, Jiarui Wang\*, Zhixiong Di, Yibo Lin. *OpenPARF: An Open-Source Placement and Routing Framework for Large-Scale Heterogeneous FPGAs with Deep Learning Toolkit*. Journal of Electronics and Information Technology (**JEIT**), 2023.

[J3] Yihua Cheng, Zejia Fan, **Jing Mai**, Yifan Wu, Pengcheng Xu, Yuxuan Yan, Zhenxin Fu, Yun Liang. *Critique of “Planetary Normal Mode Computation: Parallel Algorithms, Performance, and Reproducibility” by SCC Team From Peking University*. IEEE Transactions on Parallel and Distributed Systems (**TPDS**), 2021.

### Book Chapters .....

[B1] Yibo Lin, Zizheng Guo and **Jing Mai**. *Deep Learning Framework for Placement*, Machine Learning Applications in Electronic Design Automation, Springer, 2023, edited by Haoxing Ren and Jiang Hu. (**Invited Book Chapter**)

## Research Experiences

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### Chinese University of Hong Kong (CUHK)

Summer Intern, co-advised by Prof. Yibo Lin and Prof. Bei Yu

Topics: Electrostatics-Based global placement for FPGAs

July 2020 – Aug 2020

Shenzhen, China

## Honors and Awards

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- Industry Contribution Award, *DACS Department* April 2023
- Honors for Outstanding Undergraduate Graduates in Beijing (top 1%) May 2021
- Beijing Challenge Cup Competition (Second Prize) May 2021
- Xiaomi Scholarship, *Peking University* Dec 2020
- Honors for Merit Student, *Peking University* (top 5%) Dec 2019, Dec 2020
- Huawei Scholarship, *Peking University* Dec 2019
- Honors for Outstanding Academic Performance, *Peking University* Dec 2018
- The 43rd ACM-ICPC Asia Regional Competition (Gold Award) Nov 2018

## Teaching and Mentoring Experience

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- **Teaching Assistant** – *Optimization and Machine Learning in VLSI Design Automation*, Peking University 2022

## Skills

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### Programming Languages and Softwares

C/C++, Python, Java, Pytorch, Tensorflow,  $\text{\LaTeX}$ , Git, CUDA, Docker, Data Analysis/Visualization(Pandas)

### Web Development

HTML5, JavaScript

### EDA Tools

Xilinx Vivado

### Languages

Mandarin, Cantonese, English, Japanese