JINGSONG CHEN

Ph.D. Student
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RESEARCH INTERESTS

- Physical design of VLSI circuits
- Machine learning-related topics in physical design

EDUCATION

The Chinese University of Hong Kong, NT, Hong Kong July 2017 – Present
Ph.D. student, Department of Computer Science & Engineering.
Advisor: Prof. Evangeline F.Y. Young

Zhejiang University, Hangzhou, P.R. China Sep. 2013 – July 2017
B.Eng., Computer Science and Technology. (GPA 88.13/100)
Dissertation: "Research on StarCraft AI Based on Deep Reinforcement Learning"

RESEARCH AND PROJECT EXPERIENCE

- Detection of Largest Repeating Layout Pattern
  - Detect all the largest repeating patterns from a large flat layout in a reasonable runtime and memory.
- Initial Detailed Routing
  - Initial detailed routing with realistic design rules faced by physical design practitioners in the industry.
- Obstacle-Aware On-Track Bus Routing
  - Route buses among small obstacles while maintaining the same routing topology for all bus bits.
- Global Routing Enhancement with Deep Learning
  - Enhance global routing with predicted routing congestion using fully convolutional network.
- Wafer-Scale Deep Learning Accelerator Placement
  - Placing DNNs on wafer-scale AI accelerator with optimal kernel sizing

EXPERIENCE

Cadence Design Systems, Inc., San Jose, CA, USA May 2019 – Oct. 2019
Research Intern in Global Routing Team
Topic: Global Routing Enhancement with Deep Learning

Synopsys, Inc., Shanghai, China June 2018 – Aug. 2018
Research Intern in SEG Proteus Geometry Engine Team
Topic: Layout Pattern Detection

The Chinese University of Hong Kong, Hong Kong, China Sep. 2017 – Aug. 2020
Teaching Assistant in CSE Department

The Hong Kong Polytechnic University, NT, Hong Kong Sep. 2016 – Mar. 2017
Exchange Student in Department of Computing

SELECTED AWARDS AND HONORS

DAC Young Fellow Award 2020
First Place Award at ISPD Contest on "Wafer-Scale Deep Learning Accelerator Placement" 2020
First Place Award at ISPD Contest on "Initial Detailed Routing" 2019
First Place Award at ICCAD Contest on "Obstacle-Aware On-Track Bus Routing" 2018
Second Place Award at ISPD Contest on "Initial Detailed Routing" 2018
Full Postgraduate Studentship at CUHK 2017–

PUBLICATIONS

Conference Proceedings

[C6] **Jingsong Chen**, Jian Kuang, Guowei Zhao, Dennis Huang, and Evangeline F. Y. Young, "PROS: a Plug-in for Routability Optimization applied in the State-of-the-art Commercial EDA Tool Using Deep Learning", IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), Online, Nov. 2–5, 2020.

[C5] Bentian Jiang*, **Jingsong Chen***, Jinwei Liu, Lixin Liu, Fangzhou Wang, Xiaopeng Zhang, and Evangeline F. Y. Young, "Placing DNNs on Wafer-Scale AI Accelerator with Optimal Kernel Sizing", IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), Online, Nov. 2–5, 2020 (* co-first authors).

[C4] Haocheng Li, Gengjie Chen, Bentian Jiang, **Jingsong Chen**, and Evangeline F. Y. Young, "Dr. CU 2.0: A Scalable Detailed Routing Framework with Correct-by-Construction Design Rule Satisfaction", IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), Westminster, CO, USA, Nov. 4–7, 2019.

[C3] **Jingsong Chen**, Jinwei Liu, Gengjie Chen, Dan Zheng, and Evangeline F. Y. Young, "MARCH: Maze Routing Under a Concurrent and Hierarchical Scheme for Buses", IEEE/ACM Design Automation Conference (**DAC**), Las Vegas, NV, USA, June 2–6, 2019.

[C2] **Jingsong Chen**, James Shiely, and Evangeline F.Y. Young, "Fast Detection of Largest Repeating Layout Pattern", SPIE Advanced Lithography Conference, San Jose, CA, USA, Feb. 24–28, 2019.

[C1] Gengjie Chen, Chak-Wa Pui, Haocheng Li, **Jingsong Chen**, Bentian Jiang, and Evangeline F.Y. Young, "Detailed Routing by Sparse Grid Graph and Minimum-Area-Captured Path Search", IEEE/ACM Asia and South Pacific Design Automation Conference (**ASPDAC**), Tokyo, Japan, Jan. 21–24, 2019.

GRADUATE-LEVEL COURSES

ENGG 5501: Foundations of Optimization
ENGG 5103 Techniques for Data Mining
CSCI 5160: Advanced Algorithms
CENG 5270: EDA for Physical Design of Digital System
ENGG 5781: Matrix Analysis Computations
CSCI 5150: Machine Learning Algorithm & Application
CSCI 5610: Advanced Data Structures

TECHNICAL SKILLS

Languages	C/C++, Python, LaTeX
Operating Systems	Linux/UNIX
Toolkits	Tensorflow