

BENTIAN JIANG

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Department of Computer Science & Engineering ◊ The Chinese University of Hong Kong

RESEARCH INTERESTS

- Physical design & design for manufacturability in EDA
- Machine learning with applications in EDA
- AI compilation & performance modeling

EDUCATION

The Chinese University of Hong Kong, NT, Hong Kong SAR Aug. 2017 – July 2021

Ph.D., Department of Computer Science & Engineering

Dissertation: “Towards Automated End-to-end VLSI Design for Manufacturability Solutions”

Advisor: [Prof. Evangeline F.Y. Young](#)

([CSRankings](#): CUHK CSE ranked **1st** in the field of Design Automation)

Sichuan University, Chengdu, P.R. China

Sep. 2013 – Jul. 2017

B.Eng., Electronic & Information Engineering

Dissertation: “Extreme Bilinear Learning Machine for Lithography Hotspot Detection”

Advisor: Prof. Dahai Li

EXPERIENCES

Senior Researcher | Huawei Hong Kong Research Center

- Design Automation Lab
- On datapath subsystem optimization
- April 2022 – Present, Hong Kong SAR

Software Engineer Intern | [Cadence Design Systems Inc.](#)

- Innovus Clock Tree Synthesis Team
- 3 associated US patents
- Advisor: [Dr. Natarajan Viswanathan](#)
- April 2019 – September 2019, Austin, TX, USA

Research Assistant | [The Chinese University of Hong Kong](#)

- Bilinear Learning Machine for Lithography Hotspot Detection
- Advisor: [Prof. Evangeline F.Y. Young](#)
- March 2017 – May 2017, N.T., Hong Kong SAR

SELECTED AWARDS AND HONORS

The Hong Kong, China - Asia-Pacific Economic Cooperation Scholarship	HKSAR	2021
Talent Development Scholarship	HKSAR GSF	2021
DAC Young Fellow Award	DAC	2020
First Place Award at Contest on Wafer-Scale Deep Learning Accelerator Placement (Leader)	ISPD	2020
First Place Award at Contest on Initial Detailed Routing	ISPD	2019
Second Place Award at Contest on Timing-aware Dummy Fill Insertion (Leader)	ICCAD	2018
Second Place Award at Contest on Initial Detailed Routing	ISPD	2018
Full Postgraduate Studentship	CUHK	2017-2021
Outstanding graduate	SCU	2017

Journal Papers

- [J3] **Bentian Jiang**, Kinshi Zang, Martin D.F. Wong and Evangeline F.Y. Young, “Exploring Rule-free Layout Decomposition via Deep Reinforcement Learning”, accepted by IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**, CCF-A, top journal in EDA).
- [J2] **Bentian Jiang**, Lixin Liu, Yuzhe Ma, Bei Yu and Evangeline F.Y. Young, “Neural-ILT 2.0: Migrating ILT to Domain-specific and Multi-task-enabled Neural Network”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**, CCF-A, top journal in EDA), Volume: 41, Issue: 8, August 2022.
- [J1] **Bentian Jiang***, Jingsong Chen*, Jinwei Liu, Lixin Liu, Fangzhou Wang, Xiaopeng Zhang and Evangeline F.Y. Young, “CU.POKer: Placing DNNs on WSE with Optimal Kernel Sizing and Efficient Protocol Optimization” (* indicates co-first authors), IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**, CCF-A, top journal in EDA), Volume: 41, Issue: 6, June 2022.

Conference Proceedings

- [C9] Qijing Wang, **Bentian Jiang**, Martin D.F. Wong and Evangeline F.Y. Young, “A2-ILT: GPU Accelerated ILT with Spatial Attention Mechanism”, ACM/IEEE Design Automation Conference (**DAC**, CCF-A, top conference in EDA), San Francisco, CA, Jul. 10-14, 2022.
- [C8] Jinwei Liu, Xiaopeng Zhang, Shiju Lin, Kinshi Zang, Jingsong Chen, **Bentian Jiang**, Martin D.F. Wong and Evangeline F.Y. Young, “Partition and Place Finite Element Model on Wafer Scale Engine”, ACM/IEEE Design Automation Conference (**DAC**, CCF-A, top conference in EDA), San Francisco, CA, Jul. 10-14, 2022.
- [C7] **Bentian Jiang**, Xiaopeng Zhang, Lixin Liu and Evangeline F.Y. Young, “Building up End-to-end Mask Optimization Framework with Self-training”, ACM International Symposium on Physical Design (**ISPD**, CCF-C), Virtual Conference, March 21-24, 2021.
- [C6] **Bentian Jiang**, Lixin Liu, Yuzhe Ma, Hang Zhang, Bei Yu and Evangeline F.Y. Young, “Neural-ILT: Migrating ILT to Neural Networks for Mask Printability and Complexity Co-optimization, The 39th IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**, CCF-B, top conference in EDA), San Diego, CA, USA, Nov. 2-5, 2020.
- [C5] **Bentian Jiang***, Jingsong Chen*, Jinwei Liu, Lixin Liu, Fangzhou Wang, Xiaopeng Zhang, Evangeline F.Y. Young, “CU.POKer: Placing DNNs on Wafer-Scale AI Accelerator with Optimal Kernel Sizing”, The 39th IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**, CCF-B, top conference in EDA), San Diego, CA, USA, Nov. 2-5, 2020 (* indicates 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”, The 38th IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**, CCF-B, top conference in EDA), Westminster, CO, USA, Nov. 4-7, 2019.
- [C3] **Bentian Jiang**, Xiaopeng Zhang, Ran Chen, Gengjie Chen, Peishan Tu, Evangeline F.Y. Young and Bei Yu, “FIT: Fill Insertion Considering Timing”, The 57th ACM/IEEE Design Automation Conference (**DAC**, CCF-A, top conference in EDA), Las Vegas, NV, USA, June 2-6, 2019.
- [C2] Gengjie Chen, Chak-Wa Pui, Haocheng Li, Jingsong Chen, **Bentian Jiang**, Evangeline F.Y. Young, “Dr. CU: Detailed Routing by Sparse Grid Graph and Minimum-Area-Captured Path Search”, IEEE/ACM Asia and South Pacific Design Automation Conference (**ASP-DAC**, CCF-C), Tokyo, Japan, Jan 21-24, 2019.
- [C1] **Bentian Jiang**, Hang Zhang, Jinglei Yang and Evangeline F.Y. Young, “A Fast Machine Learning-based Mask Printability Predictor for OPC Acceleration”, IEEE/ACM Asia and South Pacific Design Automation Conference (**ASP-DAC**, CCF-C), Tokyo, Japan, Jan 21-24, 2019.

Patents

- [P2] **Bentian Jiang**, Natarajan Viswanathan, Zhuo Li and Yi-Xiao Ding, “Machine-learning based prediction method for iterative clustering during clock tree synthesis.” U.S. Patent 11,244,099, issued Feb 08, 2022..
- [P1] **Bentian Jiang**, Natarajan Viswanathan, William Robert Reece, and Zhuo Li. “Dynamic weighting scheme for local cluster refinement.” U.S. Patent 11,188,702, issued Nov 30, 2021.

RESEARCH EXPERIENCES

- Lithography Hotspot Detection
 - Extreme bilinear learning machine for lithography hotspot detection.
- Initial Detailed Routing
 - Detailed routing by sparse grid graph and minimum-area-captured path search, **1st** place at ISPD contest.
- Timing-aware Dummy Fill Insertion
 - Robust & efficient timing-aware dummy fill insertion engine, **2nd** place award at ICCAD contest.
- Optical Proximity Correction
 - Migrating inverse lithography correction to neural networks for mask printability and complexity co-optimization.
- Wafer-Scale Deep Learning Accelerator Placement
 - Placing DNNs on wafer-scale AI accelerator with optimal kernel sizing, **1st** place at ISPD contest.
- High performance adder design & optimization
 - High-speed low-power adder design methodology.

TEACHING

Spring 2020	Computer-aided Design for Very Large Scale Integrated Circuits
Fall 2019	Introduction to Discrete Mathematics and Algorithms
Spring 2019	Computer Principles and C Programming
Fall 2018	Computer Organization
Spring 2018	Problem Solving By Programming

GRADUATE-LEVEL COURSES

ENGG 5501:	Foundations of Optimization
ENGG 5781:	Matrix Analysis and Computations
ENGG 5103:	Techniques for Data Mining
CENG 5270:	EDA for Physical Design of Digital System
CENG 5030:	Energy Efficient Computing
CSCI 5010:	Practical Computational Geometry Algorithm

PROFESSIONAL SERVICES

Technical Program Committee Member

- IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**, CCF-B), 2022

Journal Reviewer

- ACM Transaction on Design Automation of Electronic Systems (**TODAES**, CCF-B)
- IEEE Transaction on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**, CCF-A)

Conference (External) Reviewer

- ACM/IEEE Design Automation Conference (**DAC**, CCF-A)
- IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**, CCF-B)

TECHNICAL SKILLS

Languages	C/C++, Python, CUDA, Tcl, L ^A T _E X
Operating Systems	Linux/UNIX
Tools	Synopsys Design Compiler [®] , Cadence [®] Genus [™] , Cadence [®] Innovus [™]