LI WEI

MPhil Student ◇ Department of Computer Science & Engineering
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RESEARCH INTERESTS

- Electronic Design Automation (Physical Design, Design for Manufacturability).
- Optimization and Acceleration of DNNs from a hardware perspective.

EDUCATION

The Chinese University of Hong Kong, Hong Kong Aug. 2019 – Aug. 2021(as expected)
Master of Philosophy, Department of Computer Science and Engineering
Supervisor: Professor Bei Yu
GPA: 3.970/4.000
TOEFL(Overall: Reading/Listening/Speaking/Writing): 106: 30/30/23/23

The Chinese University of Hong Kong, Hong Kong Aug. 2014 – Aug. 2018
Bachelor of Science, Department of Computer Science and Engineering
ELITE Stream student
Cumulative/Major GPA: 3.529/3.606

EXPERIENCE

AI Technology Center Intern, NVIDIA, HKSTP, Hong Kong Nov. 2019 – Present
Routing Tree Construction ***[ASP-DAC'21, Best Paper Award]***

- Formalized special properties of the point cloud for the routing tree construction with theoretical proof.
- Proposed an adaptive flow, which used the cloud embedding obtained by a specifically-designed model based on special properties, to select the best approach and predict the best parameter;
- Outperformed previous methods by a large margin yet being extensible and flexible.

Adaptive Layout Decomposition ***[DAC'20]***

- Proposed an adaptive workflow for efficient decomposer selection and graph matching using graph embeddings.
- Designed a graph library construction algorithm based on graph embeddings for small graphs excluding isomorphic ones.
- Reduced the runtime by 87.7% while still preserving the optimality compared with the ILP-based decomposer.

Reviewed paper for CVPR'21

Research Assistant, The Chinese University of Hong Kong, Hong Kong Feb. 2019 – July. 2019
Open-source Layout Decomposition Framework ***[TCAD'21]***

- Presented an open-source layout decomposition framework, with efficient implementations of various state-of-the-art simplification and decomposition algorithms.
- Discovered a set of issues of previous algorithms and proposed corresponding solutions.

Acceleration and Compression of DNNs ***[ICTAI'19, Best Student Paper Award]***

- Proposed a unified framework to compress CNNs by combining both lowrankness and sparsity.
- Compressed the model with up to 4.9× reduction of parameters at a cost of little loss.

Research Assistant, Southern University of Science and Technology, China June. 2018 – Jan. 2019
Testing of Auto-driving Systems ***[ICSE'20]***

- Introduced a joint optimization method to systematically generate adversarial perturbations to mislead steering of an autonomous driving system physically.
- Demonstrated the possibility of continuous physical-world tests for auto-driving scenarios as the first study.

Fault Localization ***[ISSTA'19, Distinguished Paper Award]***

- Proposed a hierarchical DL approach to automatically learn the most effective features for precise fault localization.
- Significantly outperformed state-of-the-art with over 20% improvement.

TEACHING ASSISTANT

Spring 2020	CENG3420 Computer Organization and Design
Spring 2021	CENG2030 Fundamentals of Embedded Systems

SELECTED AWARDS AND HONORS

Best Paper Award	ASP-DAC	2021
1st Place Award in EDA elite challenge	Chinese Institute of Electronics	2020
Richard Newton Young Student Fellow	DAC	2020
Best Student Paper Award	ICTAI	2019
Distinguished Paper Award	ISSTA	2019
Full Postgraduate Studentship	CUHK	2019-
2nd Place Award in CAD Contest	ICCAD	2018
ELITE Stream Student Scholarship	Faculty of Engineering, CUHK	2018
Admission Scholarship	Soong Ching Ling Foundation	2015-2018
Dean's List	Faculty of Engineering, CUHK	2015,2017,2018
Best Undergraduate Summer Project Award	Faculty of Engineering, CUHK	2017

PUBLICATIONS

Preprint

[C10] **Wei Li**, Ruxuan Li, Yuzhe Ma, Siu On Chan, Bei Yu, "Rethinking Graph Neural Networks for Graph Coloring", submitted to IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2021, under review.

Journal Papers

[J1] **Wei Li**, Yuzhe Ma, Qi Sun, Zhang Lu, Yibo Lin, Iris Hui-Ru Jiang, Bei Yu, David Z. Pan, "OpenMPL: An Open Source Layout Decomposer", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**).

Conference Papers

[C9] **Wei Li**, Guojin Chen, Haoyu Yang, Ran Chen, Bei Yu, "Learning Point Clouds in EDA", ACM International Symposium on Physical Design (**ISPD**), Mar. 21–Mar. 24, 2021.

[C8] **Wei Li**, Yuxiao Qu, Gengjie Chen, Yuzhe Ma, Bei Yu, "TreeNet: Deep Point Cloud Embedding for Routing Tree Construction", IEEE/ACM Asian and South Pacific Design Automation Conference (**ASP-DAC**), Tokyo, Jan. 18–21, 2021. **(Best Paper Award)**

[C7] **Wei Li**, Jialu Xia, Yuzhe Ma, Jialu Li, Yibo Lin, Bei Yu, "Adaptive Layout Decomposition with Graph Embedding Neural Networks", ACM/IEEE Design Automation Conference (**DAC**), San Francisco, July 19-23, 2020.

[C6] Husheng Zhou, **Wei Li**, Yuankun Zhu, Yuqun Zhang, Bei Yu, Lingming Zhang, Cong Liu, "DeepBillboard: Systematic Physical-World Testing of Autonomous Driving Systems", ACM/IEEE International Conference on Software Engineering (**ICSE**), Seoul, May 23–29, 2020.

[C5] Yuzhe Ma, Zhuolun He, **Wei Li**, Tinghuan Chen, Lu Zhang, Bei Yu, "Understanding Graphs in EDA: From Shallow to Deep Learning", ACM International Symposium on Physical Design (**ISPD**), Taipei, Mar. 25–Apr. 01, 2020.

[C4] Yuzhe Ma, Ran Chen, **Wei Li**, Fanhua Shang, Wenjian Yu, Minsik Cho, Bei Yu, "A Unified Approximation Framework for Deep Neural Networks", The IEEE International Conference on Tools with Artificial Intelligence (**ICTAI**) 2019. **(Best Student Paper Award)**

[C3] **Wei Li**, Yuzhe Ma, Qi Sun, Yibo Lin, Iris Hui-Ru Jiang, Bei Yu, David Z. Pan, "OpenMPL: An Open Source Layout Decomposer", IEEE International Conference on ASIC (**ASICON**), Chongqing, China, Oct. 29–Nov. 1, 2019.

[C2] Xia Li, **Wei Li**, Yuqun Zhang, Yuqun Zhang, Lingming Zhang, "DeepFL: Integrating Multiple Fault Diagnosis Dimensions for Deep Fault Localization",The ACM SIGSOFT International Symposium on Software Testing and Analysis (**ISSTA**), 2019. **(Distinguished Paper Award)**

[C1] Bentian Jiang, Xiaopeng Zhang, Ran Chen, Gengjie Chen, Peishan Tu, **Wei Li**, Evangeline F. Y. Young, Bei Yu, "FIT: Fill Insertion Considering Timing", ACM/IEEE Design Automation Conference (**DAC**), Las Vegas, NV, June 2-6, 2019.

TECHNICAL SKILLS

Languages	Mandarin, Cantonese, English
Programming Languages	C/C++, Python, CUDA, LaTeX