

BEI YU

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RESEARCH INTERESTS

Machine learning & combinatorial algorithms in electronic design automation (EDA) and computer vision (CV).

EXPERIENCE

Associate Professor, CSE Department	Aug. 2021 – present
Assistant Professor, CSE Department	Aug. 2015 – Aug. 2021
The Chinese University of Hong Kong, Hong Kong SAR	
Postdoctoral Researcher, ECE Department	Aug. 2014 – July 2015
University of Texas at Austin, TX, USA	

EDUCATION

University of Texas at Austin, TX, USA	Aug. 2010 – Aug. 2014
Ph.D., Department of Electrical and Computer Engineering	
Tsinghua University, Beijing, P.R. China	Sep. 2007 – Jul. 2010
M.S., Department of Computer Science and Technology	
UESTC, Chengdu, P.R. China	Sep. 2003 – Jul. 2007
B.S., Information and Compute Science	

SELECTED AWARDS AND HONORS

Best Paper Award	IEEE TSM	2022
Best Paper Award	DATE	2022
Best Paper Award	ICCAD	2021
Best Paper Award	ASPDAC	2021
Best Paper Award	Integration, VLSI Journal	2018
Best Paper Award	ISPD	2017
Best Paper Award	ICCAD	2013
Best Paper Award	ASPDAC	2012
Best Student Paper Award	ICTAI	2019
Best Student Paper Award	SPIE	2016
Best Paper Award Nomination	ISPD	2024
Best Paper Award Nomination	ASPDAC	2023
Best Paper Award Nomination	MLCAD	2022
Best Paper Award Nomination	DATE	2021
Best Paper Award Nomination	ASPDAC	2019
Best Paper Award Nomination	DAC	2014
Best Paper Award Nomination	ASPDAC	2013
Best Paper Award Nomination	ICCAD	2011
Mid-Career Award	TCSDM	2022
Ernest S. Kuh Early Career Award	CEDA	2022
Meritorious Service Award	SIGDA	2021
Outstanding Dissertation Award	EDAA	2014
Outstanding Students Abroad Award	China Scholarship Council	2014
SPIE Scholarship	SPIE	2013
IBM Ph.D. Scholarship	IBM	2012
1st Place Award in CAD Contest	ICCAD	2015
2nd Place Award in CAD Contest	ICCAD	2018
2nd Place Award in CAD Contest	ICCAD	2013
2nd Place Award in CAD Contest	ICCAD	2012
3rd Place Award in CAD Contest	ICCAD	2022
3rd Place Award in ISPD Contest	ISPD	2020
3rd Place Award in ISPD Contest	ISPD	2017
2nd Place Award in ICDAR Competition	ICDAR	2021

Journal Papers

- [J108] Shixin Chen, Shanyi Li, Zhen Zhuang, Su Zheng, Zheng Liang, Tsung-Yi Ho, Bei Yu, Alberto L. Sangiovanni-Vincentelli, “[Floorplet: Performance-aware Floorplan Framework for Chiplet Integration](#)”, accepted by IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**).
- [J107] Peiyu Liao, Yuxuan Zhao, Dawei Guo, Yibo Lin, Bei Yu, “[Analytical Die-to-Die 3D Placement with Bistratal Wirelength Model and GPU Acceleration](#)”, accepted by IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**).
- [J106] Xiaoliu Luo, Zhuotao Tian, Taiping Zhang, Bei Yu, Yuan Yan Tang, Jiaya Jia, “[PFENet: Boosting Few-shot Semantic Segmentation with the Noise-filtered Context-aware Prior Mask](#)”, accepted by IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**).
- [J105] Binwu Zhu, Su Zheng, Ziyang Yu, Guojin Chen, Yuzhe Ma, Fan Yang, Bei Yu, Martin Wong, “[L2O-ILT: Learning to Optimize Inverse Lithography Techniques](#)”, accepted by IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**).
- [J104] Zehua Pei, Xufeng Yao, Wenqian Zhao, Bei Yu, “[Quantization via Distillation and Contrastive Learning](#)”, accepted by IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**).
- [J103] Jiequan Cui, Zhisheng Zhong, Zhuotao Tian, Shu Liu, Bei Yu, Jiaya Jia, “[Generalized Parametric Contrastive Learning](#)”, accepted by IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**).
- [J102] Yuzhe Ma, Xufeng Yao, Ran Chen, Ruiyu Li, Xiaoyong Shen, Bei Yu, “[Small is Beautiful: Compressing Deep Neural Networks for Partial Domain Adaptation](#)”, accepted by IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**).
- [J101] Zhaoting Chen, Junzhe Cai, Changhao Yan, Zhaori Bi, Yuzhe Ma, Bei Yu, Dian Zhou, Xuan Zeng, “[pNeurFill: Enhanced Neural Network Model-Based Dummy Filling Synthesis with Perimeter Adjustment](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 43, no. 02, pp. 667–680, 2024.
- [J100] Yang Bai, Xufeng Yao, Qi Sun, Wenqian Zhao, Shixin Chen, Zixiao Wang, Bei Yu, “[GTCO: Graph and Tensor Co-Design for Transformer-based Image Recognition on Tensor Cores](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 43, no. 02, pp. 586–599, 2024.
- [J99] Yuyang Ye, Tinghuan Chen, Zicheng Wang, Hao Yan, Bei Yu, Longxing Shi, “[Fast and Accurate Aging-aware Cell Timing Model via Graph Learning](#)”, IEEE Transactions on Circuits and Systems II (**TCASII**), vol. 71, no. 01, pp. 156–160, 2024.
- [J98] Chen Bai, Qi Sun, Jianwang Zhai, Yuzhe Ma, Bei Yu, Martin D.F. Wong, “[BOOM-Explorer: RISC-V BOOM Microarchitecture Design Space Exploration](#)”, ACM Transactions on Design Automation of Electronic Systems (**TODAES**), vol. 29, no. 01, pp. 1–23, 2024.
- [J97] Xiaoxiao Liang, Yikang Ouyang, Haoyu Yang, Bei Yu, Yuzhe Ma, “[RL-OPC: Mask Optimization with Deep Reinforcement Learning](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 43, no. 01, pp. 340–351, 2024.
- [J96] Guojin Chen, Ziyang Yu, Hongduo Liu, Yuzhe Ma, Bei Yu, “[DevelSet: Deep Neural Level Set for Instant Mask Optimization](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 42, no. 10, pp. 5020–5033, 2023.
- [J95] Yuyang Ye, Tinghuan Chen, Yifei Gao, Hao Yan, Bei Yu, Longxing Shi, “[Aging-aware Critical Path Selection via Graph Attention Networks](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 42, no. 10, pp. 5006–5019, 2023.
- [J94] Tinghuan Chen, Silu Xiong, Huan He, Bei Yu, “[TRouter: Thermal-driven PCB Routing via Non-Local Criss-cross Attention Networks](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 42, no. 10, pp. 3388–3401, 2023.
- [J93] Wenqian Zhao, Yang Bai, Qi Sun, Wenbo Li, Haisheng Zheng, Nianjuan Jiang, Jiangbo Lu, Bei Yu, Martin D.F. Wong, “[A High-Performance Accelerator for Super-Resolution Processing on Embedded GPU](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 42, no. 10, pp. 3210–3223, 2023.
- [J92] Peiyu Liao, Dawei Guo, Zizheng Guo, Siting Liu, Yibo Lin, Bei Yu, “[DREAMPlace 4.0: Timing-driven Placement with Momentum-based Net Weighting and Lagrangian-based Refinement](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 42, no. 10, pp. 3374–3387, 2023.
- [J91] Ziyang Yu, Peiyu Liao, Yuzhe Ma, Bei Yu, Martin D.F. Wong, “[CTM-SRAF: Continuous Transmission Mask-based Constraint-aware Sub Resolution Assist Feature Generation](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (**TCAD**), vol. 42, no. 10, pp. 3402–3411, 2023.
- [J90] Su Zheng, Hao Geng, Chen Bai, Bei Yu, Martin Wong, “[Boosting VLSI Design Flow Parameter Tuning with Random Embedding and Multi-objective Trust-region Bayesian Optimization](#)”, ACM Transactions on Design Automation of Electronic Systems (**TODAES**), vol. 28, no. 05, pp. 1–23, 2023.

- [J89] Binwu Zhu, Xinyun Zhang, Yibo Lin, Bei Yu, Martin Wong, “[DRC-SG 2.0: Efficient Design Rule Checking Script Generation via Key Information Extraction](#)”, *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, vol. 28, no. 05, pp. 1–18, 2023.
- [J88] Xiaogang Xu, Yi Wang, Liwei Wang, Bei Yu, Jiaya Jia, “[Conditional Temporal Variational AutoEncoder for Action Video Prediction](#)”, *International Journal of Computer Vision (IJCV)*, vol. 131, no. 10, pp. 2699–2722, 2023.
- [J87] Ziyi Wang, Zhuolun He, Chen Bai, Haoyu Yang, Bei Yu, “[Efficient Arithmetic Block Identification with Graph Learning and Network-flow](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 42, no. 08, pp. 2591–2603, 2023.
- [J86] Siting Liu, Yuan Pu, Peiyu Liao, Hongzhong Wu, Rui Zhang, Zhitang Chen, Wenlong Lv, Yibo Lin, Bei Yu, “[FastGR: Global Routing on CPU-GPU with Heterogeneous Task Graph Scheduler](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 42, no. 07, pp. 2317–2330, 2023.
- [J85] Yilun Chen, Shijia Huang, Shu Liu, Bei Yu, Jiaya Jia, “[DSGN++: Exploiting Visual-Spatial Relation for Stereo-based 3D Detectors](#)”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 45, no. 4, pp. 4416–4429, 2023.
- [J84] Zhuotao Tian, Pengguang Chen, Xin Lai, Li Jiang, Shu Liu, Hengshuang Zhao, Bei Yu, Ming-Chang Yang, Jiaya Jia, “[Adaptive Perspective Distillation for Semantic Segmentation](#)”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 45, no. 2, pp. 1372–1387, 2023.
- [J83] Ran Chen, Shoubo Hu, Zhitang Chen, Shengyu Zhu, Bei Yu, Pengyun Li, Cheng Chen, Yu Huang, Jianye Hao, “[A Unified Framework for Layout Pattern Analysis with Deep Causal Estimation](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 42, no. 04, pp. 1199–1211, 2023.
- [J82] Tinghuan Chen, Grace Li Zhang, Bei Yu, Bing Li, Ulf Schlichtmann, “[Machine Learning in Advanced IC Design: A Methodological Survey](#)”, *IEEE Design & Test*, vol. 40, no. 01, pp. 17–33, 2023. (**Invited Paper**)
- [J81] Ulf Schlichtmann, Bing Li, Bei Yu, Raviv Gal, “[Guest Editors’ Introduction: Special Issue on Machine Learning for CAD/EDA](#)”, *IEEE Design & Test*, vol. 40, no. 01, pp. 5–7, 2023.
- [J80] Ziyang Yu, Guojin Chen, Yuzhe Ma, Bei Yu, “[A GPU-enabled Level Set Method for Mask Optimization](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 42, no. 02, pp. 594–605, 2023.
- [J79] Qi Xu, Junpeng Wang, Qi Sun, Bo Yuan, Song Chen, Bei Yu, Yi Kang, Feng Wu, “[Reliability-Driven Memristive Crossbar Design in Neuromorphic Computing Systems](#)”, *IEEE Transactions on Automation Science and Engineering (TASE)*, vol. 20, no. 01, pp. 74–87, 2023.
- [J78] Jianwang Zhai, Chen Bai, Binwu Zhu, Yici Cai, Qiang Zhou, Bei Yu, “[McPAT-Calib: A RISC-V BOOM Microarchitecture Power Modeling Framework](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 42, no. 01, pp. 243–256, 2023.
- [J77] Hao Geng, Tinghuan Chen, Yuzhe Ma, Binwu Zhu, Bei Yu, “[PTPT: Physical Design Tool Parameter Tuning via Multi-Objective Bayesian Optimization](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 42, no. 01, pp. 178–189, 2023.
- [J76] Tinghuan Chen, Bin Duan, Qi Sun, Meng Zhang, Guoqing Li, Hao Geng, Qianru Zhang, Bei Yu, “[An Efficient Sharing Grouped Convolution via Bayesian Learning](#)”, *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, vol. 33, no. 12, pp. 7367–7379, 2022.
- [J75] Qi Sun, Xufeng Yao, Arjun Ashok Rao, Bei Yu, Shiyan Hu, “[Counteracting Adversarial Attacks in Autonomous Driving](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 12, pp. 5193–5206, 2022.
- [J74] Xiaodong Wang, Changhao Yan, Yuzhe Ma, Bei Yu, Fan Yang, Dian Zhou, Xuan Zeng, “[Analog Circuit Yield Optimization via Freeze-Thaw Bayesian Optimization Technique](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 11, pp. 4887–4900, 2022.
- [J73] Wei Li, Yuzhe Ma, Yibo Lin, Bei Yu, “[Adaptive Layout Decomposition with Graph Embedding Neural Networks](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 11, pp. 5030–5042, 2022.
- [J72] Qi Xu, Hao Geng, Tianming Ni, Song Chen, Bei Yu, Xiaoqing Wen, “[Fortune: A New Fault-Tolerance TSV Configuration in Router-based Redundancy Structure](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 10, pp. 3182–3187, 2022.
- [J71] Martin Rapp, Hussam Amrouch, Yibo Lin, Bei Yu, David Z. Pan, Marilyn Wolf, Jorg Henkel, “[MLCAD: A Survey of Research in Machine Learning for CAD](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 10, pp. 3162–3181, 2022. (**Keynote Paper**)
- [J70] Guojin Chen, Wanli Chen, Qi Sun, Yuzhe Ma, Haoyu Yang, Bei Yu, “[DAMO: Deep Agile Mask Optimization for Full Chip Scale](#)”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 9, pp. 3118–3131, 2022.

- [J69] Hao Geng, Yuzhe Ma, Qi Xu, Jin Miao, Subhendu Roy, Bei Yu, “[High-Speed Adder Design Space Exploration via Graph Neural Processes](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 41, no. 8, pp. 2657–2670, 2022.
- [J68] Hao Geng, Haoyu Yang, Lu Zhang, Fan Yang, Xuan Zeng, Bei Yu, “[Hotspot Detection via Attention-based Deep Layout Metric Learning](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 41, no. 8, pp. 2685–2698, 2022.
- [J67] Bentian Jiang, Lixin Liu, Yuzhe Ma, Bei Yu, 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), vol. 41, no. 8, pp. 2671–2684, 2022.
- [J66] Yiyang Jiang, Fan Yang, Bei Yu, Dian Zhou, Xuan Zeng, “[Efficient Layout Hotspot Detection via Neural Architecture Search](#)”, ACM Transactions on Design Automation of Electronic Systems (TODAES), vol. 27, no. 6, 2022.
- [J65] Tinghuan Chen, Qi Sun, Canhui Zhan, Changze Liu, Huatao Yu, Bei Yu, “[Deep H-GCN: Fast Analog IC Aging-induced Degradation Estimation](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 41, no. 7, pp. 1990–2003, 2022.
- [J64] Yibo Lin, Xiaohan Gao, Tinghuan Chen, Bei Yu, “Machine learning for digital circuit backend design”, Micro/nano Electronics and Intelligent Manufacturing, vol. 2, no. 3, 2022. (in Chinese)
- [J63] Qi Sun, Tinghuan Chen, Siting Liu, Jianli Chen, Hao Yu, Bei Yu, “[Correlated Multi-objective Multi-fidelity Optimization for HLS Directives Design](#)”, ACM Transactions on Design Automation of Electronic Systems (TODAES), vol. 27, no. 4, 2022.
- [J62] Wei Zhong, Shuxiang Hu, Yuzhe Ma, Haoyu Yang, Xiuyuan Ma, Bei Yu, “[Deep Learning-Driven Simultaneous Layout Decomposition and Mask Optimization](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 41, no. 3, pp. 709–722, 2022.
- [J61] Ran Chen, Wei Zhong, Haoyu Yang, Hao Geng, Fan Yang, Xuan Zeng, Bei Yu, “[Faster Region-based Hotspot Detection](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 41, no. 3, pp. 669–680, 2022.
- [J60] Haoyu Yang, Shuhe Li, Wen Chen, Piyush Pathak, Frank Gennari, Ya-Chieh Lai, Bei Yu, “[DeePattern: Layout Pattern Generation with Transforming Convolutional Auto-Encoder](#)”, IEEE Transactions on Semiconductor Manufacturing (TSM), vol. 35, no. 1, pp. 67–77, 2022. **(Best Paper Award)**
- [J59] Haocheng Li, Wing-Kai Chow, Gengjie Chen, Bei Yu, and Evangeline F.Y. Young, “[Pin-Accessible Legalization for Mixed-Cell-Height Circuits](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 41, no. 1, pp. 143–154, 2022.
- [J58] Wei Li, Yuzhe Ma, Qi Sun, Lu Zhang, 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), vol. 40, no. 11, pp. 2331–2344, 2021.
- [J57] Haocheng Li, Satwik Patnaik, Mohammed Ashraf, Haoyu Yang, Johann Knechtel, Bei Yu, Ozgur Sinanoglu, Evangeline F.Y. Young, “[Deep Learning Analysis for Split Manufactured Layouts with Routing Perturbation](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 40, no. 10, pp. 1995–2008, 2021.
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- [J55] Yiyang Jiang, Fan Yang, Bei Yu, Dian Zhou, Xuan Zeng, “[Efficient Layout Hotspot Detection via Binarized Residual Neural Network Ensemble](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 40, no. 7, pp. 1476–1488, 2021.
- [J54] Haoyu Yang, Shuhe Li, Cyrus Tabery, Bingqing Lin, Bei Yu, “[Bridging the Gap Between Layout Pattern Sampling and Hotspot Detection via Batch Active Learning](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 40, no. 7, pp. 1464–1475, 2021.
- [J53] Tinghuan Chen, Bingqing Lin, Hao Geng, Shiyan Hu, Bei Yu, “[Leveraging Spatial Correlation for Sensor Drift Calibration in Smart Building](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 40, no. 7, pp. 1273–1286, 2021.
- [J52] Haoyu Yang, Wei Zhong, Yuzhe Ma, Hao Geng, Ran Chen, Wanli Chen, Bei Yu, “[VLSI Mask Optimization: From Shallow To Deep Learning](#)”, Integration, the VLSI Journal, vol. 77, Mar., pp. 96–103, 2021.
- [J51] Xiaowei Xu, Xinyi Zhang, Bei Yu, Xiaobo Sharon Hu, Christopher Rowen, Jingtong Hu, Yiyu Shi, “[DAC-SDC Low Power Object Detection Challenge for UAV Applications](#)”, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), vol. 43, no. 2, pp. 392–403, 2021.

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- [J49] Grace Li Zhang, Bing Li, Meng Li, Bei Yu, David Z. Pan, Michaela Brunner, Georg Sigl, Ulf Schlichtmann, “[TimingCamouflage+: Netlist Security Enhancement with Unconventional Timing](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 39, no. 12, pp. 4482–4495, 2020.
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- [J47] Haoyu Yang, Shuhe Li, Zihao Deng, Yuzhe Ma, Bei Yu, and Evangeline F. Y. Young, “[GAN-OPC: Mask Optimization with Lithography-guided Generative Adversarial Nets](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 39, no. 10, pp. 2822–2834, 2020.
- [J46] Kang Liu, Haoyu Yang, Yuzhe Ma, Benjamin Tan, Bei Yu, Evangeline F. Y. Young, Ramesh Karri, Siddharth Garg, “[Adversarial Perturbation Attacks on ML-based CAD: A Case Study on CNN-based Lithographic Hotspot Detection](#)”, ACM Transactions on Design Automation of Electronic Systems (TODAES), vol. 25, no. 5, 2020.
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- [J41] Meng Li, Bei Yu, Yibo Lin, Xiaoqing Xu, Wuxi Li, David Z. Pan, “[A Practical Split Manufacturing Framework for Trojan Prevention via Simultaneous Wire Lifting and Cell Insertion](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 38, no. 9, pp. 1585–1598, 2019.
- [J40] Meng Li, Kaveh Shamsi, Travis Meade, Zheng Zhao, Bei Yu, Yier Jin, David Z. Pan, “[Provably Secure Camouflaging Strategy for IC Protection](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 38, no. 8, pp. 1399–1412, 2019.
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- [J37] Song Chen, Qi Xu, Bei Yu, “[Adaptive 3D-IC TSV Fault Tolerance Structure Generation](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 38, no. 5, pp. 949–960, 2019.
- [J36] Qianru Zhang, Meng Zhang, Tinghuan Chen, Zhifei Sun, Yuzhe Ma, Bei Yu, “[Recent Advances in Convolutional Neural Network Acceleration](#)”, Neurocomputing, vol. 323, pp. 37–51, Jan., 2019.
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- [C38] David Z. Pan, Lars Liebmann, Bei Yu, Xiaoqing Xu, Yibo Lin, “Pushing Multiple Patterning in Sub-10nm: Are We Ready?”, ACM/IEEE Design Automation Conference (**DAC**), pp. 197:1–197:6, San Francisco, June 7–11, 2015. (**Invited Paper**)
- [C37] Xiaoqing Xu, Bei Yu, Jih-Rong Gao, Che-Lun Hsu, David Z. Pan, “PARR: Pin Access Planning and Regular Routing for Self-Aligned Double Patterning”, ACM/IEEE Design Automation Conference (**DAC**), pp. 28:1–28:6, San Francisco, June 7–11, 2015.
- [C36] Yibo Lin, Bei Yu, David Z. Pan, “High Performance Dummy Fill Insertion with Coupling and Uniformity Constraints”, ACM/IEEE Design Automation Conference (**DAC**), pp. 71:1–71:6, San Francisco, June 7–11, 2015.
- [C35] Wei Ye, Bei Yu, Yong-Chan Ban, Lars Liebmann, David Z. Pan, “Standard Cell Layout Regularity and Pin Access Optimization Considering Middle-of-Line”, ACM Great Lakes Symposium on VLSI (GLSVLSI), pp. 289–294, Pittsburgh, PA, May 20–22, 2015.
- [C34] Jiaojiao Ou, Bei Yu, Jih-Rong Gao, Moshe Preil, Azat Latypov, David Z. Pan, “Directed Self-Assembly Based Cut Mask Optimization for Unidirectional Design”, ACM Great Lakes Symposium on VLSI (GLSVLSI), pp. 83–86, Pittsburgh, PA, May 20–22, 2015.
- [C33] Tetsuaki Matsunawa, Bei Yu, David Z. Pan, “Optical proximity correction with hierarchical Bayes model”, SPIE Intl. Symp. Advanced Lithography - Optical Microlithography XXVIII, San Jose, CA, Feb. 22–26, 2015.

- [C32] Tetsuaki Matsunawa, Jih-Rong Gao, Bei Yu, David Z. Pan, “[A new lithography hotspot detection framework based on AdaBoost classifier and simplified feature extraction](#)”, SPIE Intl. Symp. Advanced Lithography - Design-Process-Technology Co-optimization for Manufacturability IX, San Jose, CA, Feb. 22–26, 2015.
- [C31] Xiaoqing Xu, Brian Cline, Greg Yeric, Bei Yu, David Z. Pan, “[A systematic framework for evaluating standard cell middle-of-line \(MOL\) robustness for multiple patterning](#)”, SPIE Intl. Symp. Advanced Lithography - Design-Process-Technology Co-optimization for Manufacturability IX, San Jose, CA, Feb. 22–26, 2015.
- [C30] Bei Yu, David Z. Pan, Tetsuaki Matsunawa, Xuan Zeng, “[Machine Learning and Pattern Matching in Physical Design](#)”, IEEE/ACM Asian and South Pacific Design Automation Conference (**ASPDAC**), pp. 286–293, Japan, Jan. 19–22, 2015. (**Invited Paper**)
- [C29] Jiwoo Pak, Bei Yu, David Z. Pan, “[Electromigration-aware Redundant Via Insertion](#)”, IEEE/ACM Asian and South Pacific Design Automation Conference (**ASPDAC**), pp. 544–549, Japan, Jan. 19–22, 2015.
- [C28] Bei Yu, Gilda Garretton, David Z. Pan, “[Layout Compliance for Triple Patterning Lithography: An Iterative Approach](#)”, SPIE/BACUS Photomask Symposium, Monterey, CA, Sept. 16–18, 2014. (**Invited Paper**)
- [C27] Bei Yu, David Z. Pan, “[Layout Decomposition for Quadruple Patterning Lithography and Beyond](#)”, SRC Techcon Conference, Austin, TX, Sept. 7–9, 2014.
- [C26] Jih-Rong Gao, Xiaoqing Xu, Bei Yu, David Z. Pan, “[MOSAIC: Mask Optimizing Solution With Process Window Aware Inverse Correction](#)”, ACM/IEEE Design Automation Conference (**DAC**), pp. 52:1–52:6, San Francisco, June 1–5, 2014. (**Best Paper Award Nomination**)
- [C25] Bei Yu, David Z. Pan, “[Layout Decomposition for Quadruple Patterning Lithography and Beyond](#)”, ACM/IEEE Design Automation Conference (**DAC**), pp. 53:1–53:6, San Francisco, June 1–5, 2014.
- [C24] Xiaoqing Xu, Brian Cline, Greg Yeric, Bei Yu, David Z. Pan, “[Self-Aligned Double Patterning Aware Pin Access and Standard Cell Layout Co-Optimization](#)”, ACM International Symposium on Physical Design (**ISPD**), pp. 101–108, Petaluma, March 30–April 2, 2014.
- [C23] Jih-Rong Gao, Bei Yu, Duo Ding, David Z. Pan, “[Accurate lithography hotspot detection based on PCA-SVM classifier with hierarchical data clustering](#)”, SPIE Intl. Symp. Advanced Lithography - Design-Process-Technology Co-optimization for Manufacturability VIII, San Jose, CA, Feb. 23–27, 2014.
- [C22] Bei Yu, Jih-Rong Gao, Xiaoqing Xu, David Z. Pan, “[Bridging the Gap from Mask to Physical Design for Multiple Patterning Lithography](#)”, SPIE Intl. Symp. Advanced Lithography - Design-Process-Technology Co-optimization for Manufacturability VIII, San Jose, CA, Feb. 23–27, 2014. (**Invited Paper**)
- [C21] Jih-Rong Gao, Bei Yu, David Z. Pan, “[Self-Aligned Double Patterning Layout Decomposition with Complementary E-Beam Lithography](#)”, IEEE/ACM Asian and South Pacific Design Automation Conference (**ASPDAC**), pp. 143–148, Singapore, Jan. 20–23, 2014.
- [C20] Bei Yu, Xiaoqing Xu, Jih-Rong Gao, David Z. Pan, “[Methodology for Standard Cell Compliance and Detailed Placement for Triple Patterning Lithography](#)”, IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), pp. 349–356, San Jose, Nov. 18–21, 2013. (**William J. McCalla Best Paper Award**)
- [C19] Bei Yu, Yen-Hung Lin, Gerard Luk-Pat, Duo Ding, Kevin Lucas, David Z. Pan, “[A High-Performance Triple Patterning Layout Decomposer with Balanced Density](#)”, IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), pp. 163–169, San Jose, Nov. 18–21, 2013.
- [C18] Jih-Rong Gao, Bei Yu, Duo Ding, David Z. Pan, “[Lithography Hotspot Detection and Mitigation in Nanometer VLSI](#)”, IEEE International Conference on ASIC (ASICON), pp. 1–4, Shenzhen, China, Oct. 28–31, 2013. (**Invited Paper**)
- [C17] Bei Yu, Kun Yuan, Jih-Rong Gao, David Z. Pan, “[E-BLOW: E-Beam Lithography Overlapping aware Stencil Planning for MCC System](#)”, ACM/IEEE Design Automation Conference (**DAC**), pp. 70:1–70:7, Austin, June 2–6, 2013.
- [C16] Bei Yu, Jih-Rong Gao, David Z. Pan, “[Triple-patterning lithography \(TPL\) layout decomposition using end-cutting](#)”, SPIE Intl. Symp. Advanced Lithography, San Jose, CA, Feb. 24–28, 2013.
- [C15] Jih-Rong Gao, Bei Yu, Ru Huang, David Z. Pan, “[Self-aligned Double Patterning Friendly Configuration for Standard Cell Library Considering Placement](#)”, SPIE Intl. Symp. Advanced Lithography, San Jose, CA, Feb. 24–28, 2013.
- [C14] Bei Yu, Jih-Rong Gao, David Z. Pan, “[L-Shape based Layout Fracturing for E-Beam Lithography](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (**ASPDAC**), pp. 249–254, Japan, Jan. 22–25, 2013. (**Best Paper Award Nomination**)
- [C13] Bei Yu, Jih-Rong Gao, Duo Ding, Yongchan Ban, Jae-Seok Yang, Kun Yuan, Minsik Cho, David Z. Pan, “[Dealing with IC Manufacturability in Extreme Scaling](#)”, IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), pp. 240–242, San Jose, Nov. 5–8, 2012. (**Embedded Tutorial paper**)
- [C12] Yen-Hung Lin, Bei Yu, David Z. Pan, Yih-Lang Li, “[TRIAD: A Triple Patterning Lithography Aware Detailed Router](#)”, IEEE/ACM International Conference on Computer-Aided Design (**ICCAD**), pp. 123–129, San Jose, Nov. 5–8, 2012.

- [C11] David Z. Pan, Jih-Rong Gao, Bei Yu, “[VLSI CAD for Emerging Nanolithography](#)”, International Symposium on VLSI Design, Automation and Test (VLSI-DAT), pp. 1–4, 2012. (**Invited Paper**)
- [C10] Kevin Lucas, Chris Cork, Bei Yu, Gerry Luk-Pat, Ben Painter, David Z. Pan, “[Implications of triple patterning for 14 nm node design and patterning](#)”, SPIE Advanced Lithography Symposium Design for Manufacturability through Design-Process Integration VI (Conference 8327), Feb. 2012. (**Keynote Paper**)
- [C9] Duo Ding, Bei Yu, Joydeep Ghosh, David Z. Pan, “[EPIC: Efficient Prediction of IC Manufacturing Hotspots With A Unified Meta-Classification Formulatio](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), pp. 263–270, Sydney, Jan. 30–Feb. 3, 2012. (**Best Paper Award**)
- [C8] Duo Ding, Bei Yu, David Z. Pan, “[GLOW: A Global Router for Low-Power Thermal-reliable Interconnect Synthesis using Photonic Wavelength Multiplexing](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), pp. 621–626, Sydney, Jan. 30–Feb. 3, 2012.
- [C7] Bei Yu, Kun Yuan, Boyang Zhang, Duo Ding, David Z. Pan, “[Triple Patterning Lithography Layout Decomposition](#)”, IEEE/ACM International Conference on Computer-Aided Design (ICCAD), pp. 1–8, San Jose, Nov. 2011. (**William J. McCalla Best Paper Award Nomination**)
- [C6] Bei Yu, Sheqin Dong, Yuchun Ma, Tao Lin, Yu Wang, Song Chen, Satoshi Goto, “[Network Flow-based Simultaneous Retiming and Slack Budgeting for Low Power Design](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), pp. 473–478, Japan, Jan. 2011.
- [C5] Wei Zhong, Bei Yu, Song Chen, Takeshi Yoshimura, Sheqin Dong, Satoshi Goto, “[Application-Specific Network-on-Chip Synthesis: Cluster Generation and Network Component Insertion](#)”, IEEE International Symposium on Quality Electronic Design (ISQED), pp. 144–149, Santa Clara, CA, March 14–16, 2011.
- [C4] Bei Yu, Sheqin Dong, Song Chen, Satoshi Goto, “[Floorplanning and Topology Generation for Application-Specific Network-on-Chip](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), pp. 535–540, Taipei, Jan. 2010.
- [C3] Tao Lin, Sheqin Dong, Song Chen, Bei Yu, Satoshi Goto, “[A Revisit to Voltage Partitioning Problem](#)”, ACM Great Lakes Symposium on VLSI (GLSVLSI), pp. 115–118, Providence, RI, May 16–18, 2010.
- [C2] Bei Yu, Sheqin Dong, Satoshi Goto, “[Multi-Voltage and Level-Shifter Assignment Driven Floorplanning](#)”, IEEE International Conference on ASIC (ASICON), pp. 1264–1267, Changsha, Oct. 20–23, 2009.
- [C1] Bei Yu, Sheqin Dong, Song Chen, Satoshi Goto, “[Voltage-Island Driven Floorplanning Considering Level-Shifter Positions](#)”, ACM Great Lakes Symposium on VLSI (GLSVLSI), pp. 51–56, Boston, MA, May 10–12, 2009.

Books / Book Chapters

- [B4] Haoyu Yang, Yibo Lin, Bei Yu, “Machine Learning for Mask Synthesis and Verification”, in Machine Learning Applications in Electronic Design Automation, Mark Ren eds., Springer, 2022.
- [B3] Shiyuan Hu, Bei Yu, “[Big Data Analytics for Cyber-Physical Systems](#)”, Springer, 2020.
- [B2] Bei Yu, David Z. Pan, “[Design for Manufacturability with Advanced Lithography](#)”, Springer, 2016.
- [B1] Bei Yu, David Z. Pan, “[Layout Decomposition for Triple Patterning](#)”, in Encyclopedia of Algorithms, M.-Y. Kao eds., Springer, 2015.

Dissertation

- [PHD] Bei Yu, “[Design for Manufacturing with Advanced Lithography](#)”, University of Texas at Austin, August 2014. (**EDAA Outstanding Dissertation Award**)

Newsletters

- [N4] Qi Sun, Tinghuan Chen, Jin Miao, Bei Yu, “Power-Driven DNN Dataflow Optimization on FPGA”, IEEE TCCPS Newsletter, Volume 05, Issue 01, Mar. 2020.
- [N3] Bei Yu, “Design for Manufacturability: From Ad Hoc Solution To Extreme Regular Design”, VLSI Circuits and Systems Letter, Volume 1, Issue 2, Oct. 2015.
- [N2] Bei Yu, Gilda Garretton, David Z. Pan, “Layout Compliance for Triple Patterning Lithography: An Iterative Approach”, SPIE Newsroom.
- [N1] Kevin Lucas, Chris Cork, Bei Yu, David Z. Pan, Gerry Luk-Pat, Alex Miloslavsky, Ben Painter, “Triple patterning in 10nm node metal lithography”, SPIE Newsroom.

ADVISING AND SUPERVISORSHIP

Current Students:

Wanli Chen	Ph.D	Fall 2019 – Present
Peiyu Liao	Ph.D	Fall 2020 – Present
Wenqian Zhao	Ph.D	Fall 2020 – Present
Yang Bai	Ph.D	Fall 2020 – Present
Chen Bai	Ph.D	Fall 2020 – Present
Binwu Zhu	Ph.D	Fall 2020 – Present

Siting Liu	Ph.D	Fall 2020 – Present
Yuxuan Zhao	Ph.D	Fall 2021 – Present
Ziyi Wang	Ph.D	Fall 2021 – Present
Hongduo Liu	Ph.D	Fall 2021 – Present
Xufeng Yao	Ph.D	Fall 2021 – Present
Xinyun Zhang	Ph.D	Fall 2021 – Present
Guojin Chen	Ph.D	Fall 2021 – Present
Ziyang Yu	Ph.D	Fall 2021 – Present
Zixiao Wang	Ph.D	Fall 2022 – Present
Peng Xu	Ph.D	Fall 2022 – Present
Shixin Chen	Ph.D	Fall 2022 – Present
Su Zheng	Ph.D	Fall 2022 – Present
Yu Zhang	Ph.D	Fall 2022 – Present
Shuo Yin	Ph.D	Fall 2022 – Present
Yuan Pu	Ph.D	Fall 2023 – Present
Jiayi Jiang	Ph.D	Fall 2023 – Present
Fangzhou Liu	Ph.D	Fall 2023 – Present
Lancheng Zou	Ph.D	Fall 2023 – Present
Mingjun Li	Ph.D	Fall 2023 – Present
Zehua Pei	Ph.D	Fall 2023 – Present
Yuntao Lu	Ph.D	Fall 2023 – Present
Wendong Xu	Ph.D @HKU	Fall 2023 – Present

Supervisions Completed:

Zhuolun He	PhD 2023	Postdoc@CUHK
Lu Zhang	MPhil 2023	
Qi Sun	PhD 2022	Postdoc@Cornell → ZJU100 Young Professor @Zhejiang Univ
Ran Chen	PhD 2022	Huawei Noah Lab
Hao Geng	PhD 2021	Postdoc@CUHK → Assistant Professor @ShanghaiTech
Tinghuan Chen	PhD 2021	Postdoc@CUHK → Assistant Professor @CUHK(SZ)
Wei Li	MPhil 2021	PhD@CMU
Yuzhe Ma	PhD 2020	Huawei → Assistant Professor @HKUST(GZ)
Haoyu Yang	PhD 2020	Postdoc@CUHK → Cadence → nVIDIA

Post-Doc Supervisions:

Zhuolun He	2023/09 –	
Tinghuan Chen	2021/09 – 2022/12	now Faculty @CUHK-SZ
Hao Geng	2021/09 – 2022/03	now Faculty @ShanghaiTech
Haoyu Yang	2020/08 – 2021/03	now Research Scientist@nVIDIA

Ph.D. Defense Committees Served: 2016: Jian Kuang; 2017: Yannan Liu, Wen Zong; 2018: Lingxiao Wei, Wing-Kai Chow; 2019: Gengjie Chen, Chak-Wa Pui; 2020: Ye Tian; 2021: Shujun Wang, Yanning Zhou; Bentian Jiang; Jingsong Chen; 2022: Jiequan Cui, Yilun Chen, Xiaogang Xu, Zhuotao Tian, Dan Zheng, Jinwei Liu, Da Yan (HKUST); 2023: Min Li, Lixin Liu, Fangzhou Wang, Xiangzhong Luo (NTU), Yanzhi Xu (CUHK-SZ), Yong Zhang (CUHK-SZ), Peipei Zhu (CUHK-SZ)

PROFESSIONAL SERVICE

University Committee Assignments

- Chair, Internship and Industry Liaison, 2023–present.
- Member, CUHK CSE Department Graduate Panel, 2016–2023.
- Member, CUHK CSE Department Curriculum Committee, 2015–present.

Editorial Board

- **Editor**, Technical Committee on Cyber-Physical Systems (TC-CPS) Newsletter, 2019–present.
- Associate Editor, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2024–present.
- Associate Editor, ACM Transactions on Design Automation of Electronic Systems (TODAES), 2020–present.
- Associate Editor, Integration, the VLSI Journal, 2016–present.
- Associate Editor, IET Cyber-Physical Systems: Theory & Applications, 2016–2023.

Guest Editor

- IEEE Consumer Electronics Magazine Special Issue on ISVLSI
- IEEE Design & Test Special Issue on Machine Learning for CAD / EDA

- IEEE Transactions on Sustainable Computing (TSUSC) Special Issue on Sustainable Cyber-Physical Systems
- Integration, the VLSI Journal Special Issue on Emerging Technologies for System Level Design and Interconnects.
- Integration, the VLSI Journal Special Issue on ASP-DAC 2017.
- Journal of Parallel and Distributed Computing (JPDC) Special Issue on Scalable Cyber-Physical Systems

Selected Organizers

- **Chair**, IEEE Technical Committee on Secure and Dependable Measurement (TC-SDM), 2021–Present.
- **Chair**, ACM Student Research Competition at ICCAD, 2018, 2019.
- **Chair**, EDathon, 2022.
- Organizing Committee, IEEE CEDA Hong Kong Chapter, 2017–present.
- Organizing Committee, International System Design Contest at DAC, 2018, 2019.
- Organizing Committee, EDathon, 2017, 2018, 2019, 2020, 2021.

Selected PC Member

- AAAI Conference on Artificial Intelligence (AAAI), 2023, 2024.
- ACM/IEEE Workshop on Machine Learning for CAD (MLCAD), 2019 (TPC Co-Chair), 2020, 2021.
- ACM/IEEE Design Automation Conference (DAC), 2016, 2017, 2018.
- ACM International Symposium on Physical Design (ISPD), 2017, 2018, 2019, 2020, 2023, 2024.
- ACM Great Lakes Symposium on VLSI (GLSVLSI), 2016, 2017, 2018 (CAD Track Chair).
- IEEE/ACM International Conference On Computer Aided Design (ICCAD), 2016, 2017, 2018.
- IEEE/ACM Proceedings Design, Automation and Test in Europe (DATE), 2020, 2021.
- IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), 2018, 2019, 2020, 2021, 2022 (DFM track chair), 2024 (DFM track chair).
- IEEE International Conference on Computer Design (ICCD), 2021, 2022.
- International Joint Conference on Artificial Intelligence (IJCAI), 2020.