

# 林亦波

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博士 ◇ 电子工程系

## 研究方向

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针对于超大规模集成电路设计自动化和新兴技术的建模和优化、深度学习及其应用、硬件安全

## 教育经历

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德克萨斯大学奥斯汀分校

2013 年 8 月 - 2018 年 5 月

博士学位, 电子工程系

指导老师: David Z. Pan

博士毕业论文: “Bridging Design and Manufacturing Gap through Machine Learning and Machine-Generated Layout”

(学积分 3.96/4.0)

上海交通大学

2009 年 9 月 - 2013 年 6 月

学士学位, 微电子学院

(学积分 91.17/100)

(排名 1/60)

## 工作经历

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德克萨斯大学奥斯汀分校

2018 年 7 月 - 2019 年 6 月

博后

日本东芝存储

2017 年 5 月 - 2017 年 8 月

实习

Memory lithography group

比利时微电子研究中心 (IMEC)

2016 年 9 月 - 2016 年 11 月

实习

Design technology co-optimization for emerging lithography options

香港中文大学

2016 年 6 月 - 2016 年 8 月

实习

Quantum computing

铿腾半导体

2015 年 5 月 - 2015 年 8 月

实习

Routability driven detailed placement

甲骨文股份有限公司

2014 年 5 月 - 2014 年 8 月

实习

Incremental timing driven detailed placement

## 授课经历

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客座讲座	EE382M: VLSI Physical Design Automation	2017 年秋
研究生课程助教	EE382M: VLSI I	2014 年秋

## 出版物

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### 书籍章节

- [B1] **Yibo Lin** and David Z. Pan, “Machine Learning in Physical Verification, Mask Synthesis, and Physical Design”, Machine Learning in VLSI Computer-Aided Design, Springer, 2018, edited by Abe Elfedel, Duane Boning and Xin Li. (**Invited Book Chapter**)(to be published)

### 期刊论文

- [J12] **Yibo Lin**, Meng Li, Yuki Watanabe, Taiki Kimura, Tetsuaki Matsunawa, Shigeki Nojima and David Z. Pan, “[Data Efficient Lithography Modeling with Transfer Learning and Active Data Selection](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2019. (accepted)
- [J11] **Yibo Lin**, Bei Yu, Meng Li and David Z. Pan, “[Layout Synthesis for Topological Quantum Circuits with 1D and 2D Architectures](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Aug, 2018.
- [J10] Xiaoqing Xu, **Yibo Lin**, Meng Li, Tetsuaki Matsunawa, Shigeki Nojima, Chikaaki Kodama, Toshiya Kotani and David Z. Pan, “[Sub-Resolution Assist Feature Generation with Supervised Data Learning](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Jun, 2018.
- [J9] **Yibo Lin**, Bei Yu, Xiaoqing Xu, Jih-Rong Gao, Natarajan Viswanathan, Wen-Hao Liu, Zhuo Li, Charles J Alpert and David Z. Pan, “[MrDP: Multiple-row detailed placement of heterogeneous-sized cells for advanced nodes](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Jun, 2018.
- [J8] Wuxi Li, **Yibo Lin**, Meng Li, Shounak Dhar and David Z. Pan, “[UTPlaceF 2.0: A High-Performance Clock-Aware FPGA Placement Engine](#)”, ACM Transactions on Design Automation of Electronic Systems (TODAES), Jun, 2018.
- [J7] **Yibo Lin**, Bei Yu and David Z. Pan, “[High performance dummy fill insertion with coupling and uniformity constraints](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Sep, 2017.
- [J6] **Yibo Lin**, Bei Yu, Biying Xu and David Z. Pan, “[Triple patterning aware detailed placement toward zero cross-row middle-of-line conflict](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Jul, 2017.
- [J5] Xiaoqing Xu, **Yibo Lin**, Meng Li, Jiaojiao Ou, B. Cline and D. Z. Pan, “[Redundant local-Loop insertion for unidirectional routing](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), Jul, 2017.
- [J4] **Yibo Lin**, Bei Yu, Yi Zou, Zhuo Li, Charles J Alpert and David Z. Pan, “[Stitch aware detailed placement for multiple e-beam lithography](#)”, Integration, the VLSI Journal, Jun, 2017. (**Best Paper Award**)

- [J3] **Yibo Lin**, Xiaoqing Xu, Bei Yu, Ross Baldick and David Z. Pan, “[Triple/quadruple patterning layout decomposition via linear programming and iterative rounding](#)”, Journal of Micro/Nanolithography, MEMS, and MOEMS (JM3), Jun, 2017.
- [J2] Bei Yu, Xiaoqing Xu, Subhendu Roy, **Yibo Lin**, Jiaojiao Ou and David Z. Pan, “[Design for manufacturability and reliability in extreme-scaling VLSI](#)”, Science China Information Sciences, 2016. (**Invited paper**)
- [J1] Bei Yu, Xiaoqing Xu, Jih-Rong Gao, **Yibo Lin**, Zhuo Li, Charles Alpert and David Z. Pan, “[Methodology for standard cell compliance and detailed placement for triple patterning lithography](#)”, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), May, 2015.

#### 会议论文

- [C18] Ying Chen, **Yibo Lin**, Tianyang Gai, Yajuan Su, Yayi Wei and David Z. Pan, “Semi-Supervised Hotspot Detection with Self-Paced Multi-Task Learning”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), Tokyo, Japan, Jan 21-24, 2019. (accepted)
- [C17] Wei Ye, Mohamed Baker Alawieh, **Yibo Lin** and David Z. Pan, “Tackling Signal Electromigration with Learning-Based Detection and Multistage Mitigation”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), Tokyo, Japan, Jan 21-24, 2019. (accepted)
- [C16] Jiong Zhang, **Yibo Lin**, Zhao Song and Inderjit S Dhillon, “[Learning Long Term Dependencies via Fourier Recurrent Units](#)”, International Conference on Machine Learning (ICML), Stockholm, Sweden, Jun 10-15, 2018.
- [C15] **Yibo Lin**, Yuki Watanabe, Taiki Kimura, Tetsuaki Matsunawa, Shigeki Nojima, Meng Li and David Z. Pan, “[Data Efficient Lithography Modeling with Residual Neural Networks and Transfer Learning](#)”, ACM International Symposium on Physical Design (ISPD), Monterey, CA, Mar 25-28, 2018.
- [C14] Meng Li, Bei Yu, **Yibo Lin**, Xiaoqing Xu, Wuxi Li and David Z. Pan, “[A Practical Split Manufacturing Framework for Trojan Prevention via Simultaneous Wire Lifting and Cell Insertion](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), Jeju, Korea, Jan 22-25, 2018.
- [C13] **Yibo Lin**, Peter Debacker, Darko Trivkovic, Ryoung-han Kim, Praveen Raghavan and David Z. Pan, “[Patterning Aware Design Optimization of Selective Etching in N5 and Beyond](#)”, IEEE International Conference on Computer Design (ICCD), Boston, MA, Nov 5-8, 2017.
- [C12] **Yibo Lin**, Xiaoqing Xu, Jiaojiao Ou and David Z. Pan, “[Machine learning for mask/wafer hotspot detection and mask synthesis](#)”, Photomask Technology, Oct 16, 2017. (**Invited paper**)
- [C11] Wei Ye, **Yibo Lin**, Xiaoqing Xu, Wuxi Li, Yiwei Fu, Yongsheng Sun, Canhui Zhan and David Z. Pan, “[Placement Mitigation Techniques for Power Grid Electromigration](#)”, IEEE International Symposium on Low Power Electronics and Design (ISLPED), Taipei, Jul 24-26, 2017.
- [C10] Xiaoqing Xu, **Yibo Lin**, Vinicius Livramento and David Z. Pan, “[Concurrent Pin Access Optimization for Unidirectional Routing](#)”, ACM/IEEE Design Automation Conference (DAC), Austin, TX, Jun 18-22, 2017.
- [C9] Jiaojiao Ou, Bei Yu, Xiaoqing Xu, Joydeep Mitra, **Yibo Lin** and David Z. Pan, “[DSAR: DSA aware routing with simultaneous DSA guiding pattern and double patterning assignment](#)”, ACM International

Symposium on Physical Design (ISPD), Portland, OR, Mar 19-22, 2017.

- [C8] **Yibo Lin**, Bei Yu, Xiaoqing Xu, Jhih-Rong Gao, Natarajan Viswanathan, Wen-Hao Liu, Zhuo Li, Charles J Alpert and David Z. Pan, “[MrDP: Multiple-row detailed placement of heterogeneous-sized cells for advanced nodes](#)”, IEEE/ACM International Conference on Computer-Aided Design (ICCAD), Austin, TX, Nov 7-10, 2016.
- [C7] Yudong Tao, Changhao Yan, **Yibo Lin**, Sheng-Guo Wang, David Z. Pan and Xuan Zeng, “[A novel unified dummy fill insertion framework with SQP-based optimization method](#)”, IEEE/ACM International Conference on Computer-Aided Design (ICCAD), Austin, TX, Nov 7-10, 2016.
- [C6] **Yibo Lin**, Bei Yu and David Z. Pan, “[Detailed placement in advanced technology nodes: a survey](#)”, IEEE International Conference on Solid-State and Integrated Circuit Technology (ICSICT), Hangzhou, China, Oct 25-28, 2016. (**Invited paper**)
- [C5] **Yibo Lin**, Xiaoqing Xu, Bei Yu, Ross Baldick and David Z. Pan, “[Triple/quadruple patterning layout decomposition via novel linear programming and iterative rounding](#)”, Proceedings of SPIE, San Jose, CA, Feb 21-25, 2016. (**Best Student Paper Award**)
- [C4] **Yibo Lin**, Bei Yu, Yi Zou, Zhuo Li, Charles J Alpert and David Z. Pan, “[Stitch aware detailed placement for multiple e-beam lithography](#)”, IEEE/ACM Asia and South Pacific Design Automation Conference (ASPDAC), Macau, China, Jan 25-28, 2016.
- [C3] **Yibo Lin**, Bei Yu, Biying Xu and David Z. Pan, “[Triple patterning aware detailed placement toward zero cross-row middle-of-line conflict](#)”, IEEE/ACM International Conference on Computer-Aided Design (ICCAD), Austin, TX, Nov 2-6, 2015.
- [C2] **Yibo Lin**, Bei Yu and David Z. Pan, “[High performance dummy fill insertion with coupling and uniformity constraints](#)”, ACM/IEEE Design Automation Conference (DAC), San Francisco, CA, Jun 7-11, 2015.
- [C1] David Z. Pan, Lars Liebmann, Bei Yu, Xiaoqing Xu and **Yibo Lin**, “[Pushing multiple patterning in sub-10nm: are we ready?](#)”, ACM/IEEE Design Automation Conference (DAC), San Francisco, CA, Jun 7-11, 2015. (**Invited Paper**)

## 相关课程

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- |   |                                |
|---|--------------------------------|
| • EE382M: VLSI I                          | <i>Prof. Michael Orshansky</i> |
| • EE382N: Computer Architecture           | <i>Prof. Aater Suleman</i>     |
| • EE382V: Optimization Issues in VLSI CAD | <i>Prof. David Pan</i>         |
| • EE382M: VLSI II                         | <i>Prof. Jacob Abraham</i>     |
| • EE380L: Engineer Programming Languages  | <i>Prof. Craig Chase</i>       |
| • EE382V: Nanometer Scale IC Design       | <i>Prof. Michael Orshansky</i> |
| • EE382V: VLSI Physical Design Automation | <i>Prof. David Pan</i>         |
| • EE381V: Advanced Algorithms             | <i>Prof. Evdokia Nikolova</i>  |
| • EE382V: Advanced Programming Tools      | <i>Prof. Aziz Adnan</i>        |

- EE380N: Optimization in Engineering Systems
- CS383C: Numerical Analysis: Linear Algebra

*Prof. Ross Baldick*

*Prof. Robert van de Geijn*

## 技能

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### 编程语言

C/C++, Python, Verilog

### 网页制作

HTML5, JavaScript/jQuery

### 设计自动化工具

Cadence Virtuoso, Synopsys Design Compiler, Synopsys IC Compiler

## 奖项及荣誉

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首届最佳论文	Integration, the VLSI Journal	2018 年
Graduate Continuing Fellowship	德克萨斯大学奥斯汀分校	2017 年
Franco Cerrina Memorial 最佳学生论文	SPIE	2016 年
A. Richard Newton Young Student Fellow	DAC	2014 年
国家奖学金	上海交通大学	2012 年
三星奖学金	上海交通大学	2011 年
二等奖学金	上海交通大学	2010 年