

YIBO LIN

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PhD ◊ Department of Electrical & Computer Engineering

RESEARCH INTERESTS

Modeling and optimization in VLSI CAD and emerging technology, machine learning applications, and hardware security

EDUCATION

University of Texas at Austin, TX, USA

Aug. 2013 – May 2018

Ph.D. student, Department of Electrical and Computer Engineering

Advisor: David Z. Pan

Dissertation: “Bridging Design and Manufacturing Gap through Machine Learning and Machine-Generated Layout”

(GPA 3.96/4.0)

Shanghai Jiao Tong University, Shanghai, P.R.China

Sep. 2009 – Jun. 2013

B.S., Department of Microelectronics

(GPA 91.17/100)

(Rank top 1/60)

EXPERIENCE

University of Texas at Austin, Texas, U.S.

Jun. 2018 – Jun. 2019

Postdoc

ECE Department

Toshiba Memory Corporation, Yokohama, Japan

May 2017 – Aug. 2017

Internship

Memory lithography group

IMEC, Leuven, Belgium

Sep. 2016 – Nov. 2016

Internship

Design technology co-optimization for emerging lithography options

Chinese University of Hong Kong, China

Jun. 2016 – Aug. 2016

Summer Intern

Quantum computing

Cadence Design System, TX, USA

May 2015 – Aug. 2015

Summer Intern

Routability driven detailed placement

Oracle Inc., TX, USA

May 2014 – Aug. 2014

Summer Intern

Incremental timing driven detailed placement

TEACHING EXPERIENCE

Guest Lecture

EE382M: VLSI Physical Design Automation

Fall 2017

Graduate Teaching Assistant

EE382M: VLSI I

Fall 2014

PUBLICATIONS

Book Chapters

- [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)

Journal Papers

- [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), 2018. (submitted)
- [J11] 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), 2017. (accepted)
- [J10] **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), Oct 6, 2017.
- [J9] 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), Aug 31, 2017.
- [J8] **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), Aug 31, 2017.
- [J7] **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**)
- [J6] **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), May 18, 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), Jan 11, 2017.
- [J4] **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), Jan 05, 2017.
- [J3] 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**)
- [J2] **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), Dec, 2016.
- [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.

Conference Papers

- [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**)

RELATED COURSES

| | |
|---|----------------------------------|
| • 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 | <i>Prof. Ross Baldick</i> |
| • CS383C: Numerical Analysis: Linear Algebra | <i>Prof. Robert van de Geijn</i> |

SKILLS

Programming Languages

C/C++, Python, Verilog

Web Development

HTML5, JavaScript/jQuery

EDA Tools

Cadence Virtuoso, Synopsys Design Compiler, Synopsys IC Compiler

AWARDS AND HONORS

| | | |
|--|-------------------------------|------|
| Inaugural Best Paper Award | Integration, the VLSI Journal | 2018 |
| Graduate Continuing Fellowship | University of Texas at Austin | 2017 |
| Franco Cerrina Memorial Best Student Paper Award | SPIE | 2016 |
| A. Richard Newton Young Student Fellow | DAC | 2014 |
| National Scholarship | Shanghai Jiao Tong University | 2012 |
| Samsung Scholarship | Shanghai Jiao Tong University | 2011 |
| The Second Prize Scholarship | Shanghai Jiao Tong University | 2010 |