

Curriculum Vitae

Lehrstuhl für Entwurfsautomatisierung
Chair of Electronic Design Automation
Technical University of Munich
Arcisstraße 21
80333 Munich, Germany
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PERSONAL INFORMATION

Born on 30th August 1988 in Jilin, China
Doctoral researcher at the Chair of Electronic Design Automation, Technical University of Munich
Personal webpage: <https://www.ce.cit.tum.de/eda/personen/mengchu-li/>

RESEARCH INTERESTS

- Mathematical modeling
- Design synthesis, verification, and testing for microfluidic large-scale integration
- Design automation for optical network-on-chip

EDUCATION AND EXPERIENCE

Doctoral researcher Chair of Electronic Design Automation Technical University of Munich, Munich, Germany	06.2019 – Present
Master Informatik (<i>Master of Science</i>) Ludwig Maximilian University of Munich, Munich, Germany	10.2017 – 04.2019
Bachelor Informatik plus Mathematik (<i>Bachelor of Science</i>) Ludwig Maximilian University of Munich, Munich, Germany	04.2013 – 09.2017
Bachelor Germanistik (<i>Bachelor of Arts</i>) Tongji University, Shanghai, China	09.2007 – 07.2011

TEACHING

Courses:

- 23/24 winter semester:
 - TA of *Mixed Integer Programming and Graph Algorithms for Engineering Problems* (88 students)
 - TA of *Electronic Design Automation* (247 students)
- 22/23 winter semester:
 - TA of *Mixed Integer Programming and Graph Algorithms for Engineering Problems* (81 students)
 - TA of *Electronic Design Automation* (283 students)

- 21/22 winter semester:
 - TA of *Mixed Integer Programming and Graph Algorithms for Engineering Problems* (111 students)
 - TA of *Electronic Design Automation* (263 students)
- 20/21 winter semester:
 - TA of *Mixed Integer Programming and Graph Algorithms for Engineering Problems* (107 students)
 - TA of *Electronic Design Automation* (280 students)
- 19/20 winter semester:
 - TA of *Mixed Integer Programming and Graph Algorithms for Engineering Problems* (79 students)
 - a course that I developed from scratch together with the lecturer, Dr.-Ing. Tsun-Ming Tseng

So far I have co-supervised 5 master’s theses, 3 bachelor’s theses and 1 master-level research internship. The research outcome of two master’s theses and a bachelor’s thesis were published in the proceedings of prestigious international conferences, *IEEE/ACM International Conference on Computer-Aided Design (ICCAD) 2021*, *Design, Automation and Test in Europe (DATE) 2022*, and *IEEE/ACM International Conference on Computer-Aided Design (ICCAD) 2022*, respectively.

AWARD

- Bronze medal, ACM Student Research Competition at ICCAD 2020
- Chinese government award for outstanding self-financed students abroad 2022

GRANT

- **“Physical Design for Microfluidic Large-Scale Integration with Partitioning and Floorplanning”**
DFG research grant, proposal generation in collaboration with the PI Dr.-Ing. Tsun-Ming Tseng since 2023, EUR 331.9K
- **“Bandwidth Maximization and Allocation for Wavelength-Routed Optical Networks-on-Chip (WRONoC)”**
DFG research grant, proposal generation in collaboration with the PI Dr.-Ing. Tsun-Ming Tseng since 2023, EUR 222.2K
- **“Design and Integration of Test Module for Microfluidic Large-Scale Integration (mLSI)”**
DFG research grant, proposal generation in collaboration with the PI Dr.-Ing. Tsun-Ming Tseng since 2021, EUR 312.1K

SERVICE

- Journal reviewer:
IEEE Transactions on Information Forensics and Security (TIFS), since 2020

PATENT

- Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“Device with Blockable/Un-Blockable Fluid Channels and Built-In Self-Test Equipment”
 EU/US Patent, published on 12th/13th January 2022

PUBLICATIONS

Book Chapters:

1. Tsun-Ming Tseng, Mengchu Li, Zhidan Zheng, Alexandre Truppel, Ulf Schlichtmann
“Efficiency-Oriented Design Automation Methods for Wavelength-Routed Optical Network-on-Chip”
In: *Silicon Photonics for High-Performance Computing and Beyond*, CRC Press, November 2021

International Journal Articles:

1. Yushen Zhang, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“Open-Source Interactive Design Platform for 3D-Printed Microfluidic Devices”
Communications Engineering 3, 71, May 2024
2. Zhidan Zheng, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“LightR: A Fault-Tolerant Wavelength-Routed Optical Networks-on-Chip Topology”
MDPI Applied Sciences 13(15), 8871, August 2023
3. Mengchu Li, Yushen Zhang, Ju Young Lee, Hudson Gasvoda, Ismail Emre Araci, Tsun-Ming Tseng, Ulf Schlichtmann
“Integrated Test Module Design for Microfluidic Large-Scale Integration”
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 42(6), 1939–1950, June 2023
4. Philipp Rinklin, Tsun-Ming Tseng, Cai Liu, Mengchu Li, Korkut Terkan, Leroy Grob, Nouran Adly, Sabine Zips, Lennart Weiß, Ulf Schlichtmann, Bernhard Wolfrum
“Electronic Design Automation for Increased Robustness in Inkjet-Printed Electronics”
Flexible and Printed Electronics 4(4), October 2019
5. Tsun-Ming Tseng, Mengchu Li, Daniel Nestor Freitas, Travis McAuley, Bing Li, Tsung-Yi Ho, Ismail Emre Araci, Ulf Schlichtmann
“Columba 2.0: A Co-Layout Synthesis Tool for Continuous-Flow Microfluidic Biochips”
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 37(8), 1588–1601, August 2018
6. Tsun-Ming Tseng, Bing Li, Mengchu Li, Tsung-Yi Ho, Ulf Schlichtmann
“Reliability-aware Synthesis with Dynamic Device Mapping and Fluid Routing for Flow-based Microfluidic Biochips”
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 35(12), 1981–1994, December 2016

International Conference Proceedings:

1. Liaoyuan Cheng, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“Minimizing Worst-Case Data Transmission Cycles in Wavelength-Routed Optical NoC through Bandwidth Allocation”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), October 2024
— **Acceptance Rate: 24%**
2. Siyuan Liang, Rongliang Fu, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann, Tsung-Yi Ho
“RABER: Reliability-Aware Bayesian-Optimization-based Control Layer Escape Routing for Flow-based Microfluidics”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), October 2024
— **Acceptance Rate: 24%**

3. Mengchu Li, Hanchen Gu, Yushen Zhang, Siyuan Liang, Hudson Gasvoda, Rana Altay, Ismail Araci, Tsun-Ming Tseng, Tsung-Yi Ho, Ulf Schlichtmann
“Late Breaking Results: Efficient Built-in Self-Test for Microfluidic Large-Scale Integration (mLSI)”
ACM/IEEE Design Automation Conference (DAC), June 2024
 — **Acceptance Rate: 21%**
4. Siyuan Liang, Yushen Zhang, Rana Altay, Hudson Gasvoda, Mengchu Li, Ismail Emre Araci, Tsun-Ming Tseng, Ulf Schlichtmann, Tsung-Yi Ho
“LaMUX: Optimized Logic-Gate-Enabled High-Performance Microfluidic Multiplexer Design”
ACM/IEEE Design Automation Conference (DAC), June 2024
 — **Acceptance Rate: 23%**
5. Siyuan Liang, Meng Lian, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann, Tsung-Yi Ho
“ARMM: Adaptive Reliability Quantification Model of Microfluidic Designs and Its Graph-Transformer-Based Implementation”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), October 2023
 — **Acceptance Rate: 22.9%**
6. Zhidan Zheng, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“XRing: A Crosstalk-Aware Synthesis Method for Wavelength-Routed Optical Ring Routers”
Design, Automation and Test in Europe (DATE), April 2023
 — **Acceptance Rate: 25%**
7. Meng Lian, Yushen Zhang, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“FXT-Route: Efficient High-Performance PCB Routing with Crosstalk Reduction Using Spiral Delay Lines”
ACM/SIGDA International Symposium on Physical Design (ISPD), March 2023
8. Siyuan Liang, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann, Tsung-Yi Ho
“CoMUX: Combinatorial-Coding-Based High-Performance Microfluidic Control Multiplexer Design”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), October 2022
 — **Acceptance Rate: 22%**
9. Duan Shen, Yushen Zhang, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“Contamination-Free Switch Design and Synthesis for Microfluidic Large-Scale Integration”
Design, Automation and Test in Europe (DATE), March 2022
 — **Acceptance Rate: 25%**
10. Zhidan Zheng, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“ToPro: A Topology Projector and Waveguide Router for Wavelength-Routed Optical Networks-on-Chip”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2021
 — **Acceptance Rate: $121/514 = 23.5\%$**
11. Tsun-Ming Tseng, Meng Lian, Mengchu Li, Philipp Rinklin, Leroy Grob, Bernhard Wolfrum, Ulf Schlichtmann
“Manufacturing Cycle-Time Optimization Using Gaussian Drying Model for Inkjet-Printed Electronics”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2021
 — **Acceptance Rate: $121/514 = 23.5\%$**

12. Fangda Zuo, Mengchu Li, Tsun-Ming Tseng, Tsung-Yi Ho, Ulf Schlichtmann
“Relative-Scheduling-Based High-Level Synthesis for Flow-Based Microfluidic Biochips”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2021
 — **Acceptance Rate: 121/514 = 23.5%**
13. Zhidan Zheng, Mengchu Li, Tsun-Ming Tseng, Ulf Schlichtmann
“Light: A Scalable and Efficient Wavelength-Routed Optical Networks-On-Chip Topology”
IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC), January 2021
 — **Acceptance Rate: 111/327 = 34.2%**
14. Mengchu Li, Tsun-Ming Tseng, Mahdi Tala, Ulf Schlichtmann
“Maximizing the Communication Parallelism for Wavelength-Routed Optical Networks-on-Chips”
IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC), January 2020
 — **Acceptance Rate: 86/263 = 32.7%**
15. Tsun-Ming Tseng, Mengchu Li, Yushen Zhang, Tsung-Yi Ho, Ulf Schlichtmann
“Cloud Columba: Accessible Design Automation Platform for Production and Inspiration”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2019
 — **Invited Paper**
16. Tsun-Ming Tseng, Alexandre Truppel, Mengchu Li, Mahdi Nikdast, Ulf Schlichtmann
“Wavelength-Routed Optical NoCs: Design and EDA — State of the Art and Future Directions”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2019
 — **Invited Paper**
17. Mengchu Li, Tsun-Ming Tseng, Yanlu Ma, Tsung-Yi Ho, Ulf Schlichtmann
“VOM: Flow-Path Validation and Control-Sequence Optimization for Multilayered Continuous-Flow Microfluidic Biochips”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2019
 — **Acceptance Rate: 94/394 = 23.9%**
18. Mengchu Li, Tsun-Ming Tseng, Davide Bertozzi, Mahdi Tala, Ulf Schlichtmann
“CustomTopo: A Topology Generation Method for Application-Specific Wavelength-Routed Optical NoCs”
IEEE/ACM International Conference on Computer-Aided Design (ICCAD), November 2018
 — **Acceptance Rate: 98/396 = 24.7%**
19. Tsun-Ming Tseng, Mengchu Li, Daniel Nestor Freitas, Amy Mongersun, Ismail Emre Araci, Tsung-Yi Ho, Ulf Schlichtmann
“Columba S: A Scalable Co-Layout Design Automation Tool for Microfluidic Large-Scale Integration”
ACM/IEEE Design Automation Conference (DAC), June 2018
 — **Acceptance Rate: 168/691 = 24.3%**
20. Mengchu Li, Tsun-Ming Tseng, Bing Li, Tsung-Yi Ho, Ulf Schlichtmann
“Component-Oriented High-Level Synthesis for Continuous-Flow Microfluidics Considering Hybrid-Scheduling”
ACM/IEEE Design Automation Conference (DAC), June 2017
 — **Acceptance Rate: 161/676 = 23.8%**
21. Tsun-Ming Tseng, Mengchu Li, Bing Li, Tsung-Yi Ho, Ulf Schlichtmann
“Columba: Co-Layout Synthesis for Continuous-Flow Microfluidic Biochips”
ACM/IEEE Design Automation Conference (DAC), June 2016
 — **Acceptance Rate: 152/878 = 17.3%**

22. Mengchu Li, Tsun-Ming Tseng, Bing Li, Tsung-Yi Ho, Ulf Schlichtmann
“Sieve-valve-aware Synthesis of Flow-based Microfluidic Biochips Considering Specific Biological Execution Limitations”
Design, Automation and Test in Europe (DATE), March 2016
— **Acceptance Rate: 199/829 = 24%**