# YINGJIE LI

https://lyj1201.github.io/yingjieli/

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## RESEARCH INTEREST

- **End-to-end Design and Compilation for Optical AI systems**
- **Physics-aware Hardware-Software Codesign**
- **Electronic Design Automation**

## EDUCATION & EMPLOYMENT

| | |
|---|---:|
| **University of Maryland, College Park (transferred)** | *2023-Present* |
| **University of Utah** | *2020-2023* |
| Ph.D. (post-candidacy), Computer Engineering (Advisor: Prof. Cunxi Yu) | |
| **Cornell University** | *2018-2019* |
| M.Eng, Electrical and Computer Engineering | |
| **Huazhong University of Science and Technology** | *2014-2018* |
| B.S., Electrical and Computer Engineering (Honor) | |

## EMPLOYMENT

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|---|---:|
| **NVIDIA Research** | *Summer 2023* |
| Research Intern, *ML/RL for EDA* | *Manager: Mark Haoxing Ren* |
| **DELL EMC, Shanghai, China** | *2019-2020* |
| Hardware Engineer | |

## AWARDS

- **2nd Place at ACM Student Research Competition** (ICCAD 2023)
- **EECS Rising Star 2023**
- **Best Paper Award**, Design Automation Conference (DAC 2023)
- **Best Poster Honorable Mention**, American Physics Society DLS (2022)
- **DAC Young Student Fellow**, 2020 (**winning presentation**), 2021, 2022
- **Outstanding Graduates**, Huazhong University of Science and Technology, 2018
- **Social Service Award**, Huazhong University of Science and Technology, 2016

## PUBLICATIONS

**2023**

- **Yingjie Li**, Mingju Liu, Mark Ren, Alan Mishchenko, Cunxi Yu. *DAG-aware Synthesis Orchestration* IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD). *under review*
- **Yingjie Li**, Mingju Liu, Alan Mishchenko, Cunxi Yu. *Invited Paper: Verilog-to-PyG – A Framework for Graph Learning and Augmentation on RTL Designs* The International Conference on Computer-Aided Design (ICCAD'23). Web

- **Yingjie Li**, Ruiyang Chen, Minhan Lou, Berardi Sensale-Rodriguez, Weilu Gao, Cunxi Yu. *LightRidge: An End-to-end Agile Design Framework for Diffractive Optical Neural Networks* The ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'23).

- **Yingjie Li**, Weilu Gao, Cunxi Yu. *Rubik's Optical Neural Networks: Multi-task Learning with Physics-aware Rotation Architecture.* The 32nd International Joint Conference on Artificial Intelligence (IJCAI-23).

- **Yingjie Li**\*, Shanglin Zhou\*, Cunxi Yu, and Caiwen Ding. *Physics-aware Roughness Optimization for Diffractive Optical Neural Networks.* IEEE/ACM 60th Design Automation Conference (DAC '23).

- Nan Wu, **Yingjie Li**, Cong "Callie" Hao, Steve Dai, Cunxi Yu and Yuan Xie. *Gamora: Graph Learning based Symbolic Reasoning for Large-Scale Boolean Networks.* IEEE/ACM 60th Design Automation Conference (DAC '23). (**Best Paper Award**). (Open-source: `https://github.com/Yu-Maryland/Gamora`)

- Jiaqi Yin, **Yingjie Li**, Daniel Robinson, Cunxi Yu. *RESPECT: Reinforcement Learning based Edge Scheduling on Pipelined Coral Edge TPUs.* IEEE/ACM 60th Design Automation Conference (DAC '23).

- Minhan Lou, **Yingjie Li**, Cunxi Yu, Berardi Sensale-Rodriguez, Weilu Gao. *Effects of interlayer Reflection and Interpixel Interaction in Diffractive Optical Neural Networks.* Optical Letter. Jan 2023.

**2022**

- Walter Lau Neto, **Yingjie Li**, Pierre-Emmanuel Gaillardon, and Cunxi Yu. *FlowTune: End-to-end Automatic Logic Optimization Exploration via Domain-specific Multi-armed Bandits.* IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD'22).

- **Yingjie Li**\*, Ruiyang Chen\*, Minhan Lou, Jichao Fan, Yingheng Tang, Berardi Sensale-Rodriguez, Cunxi Yu, Weilu Gao. *Physics-aware Complex-valued Adversarial Machine Learning in Reconfigurable Diffractive All-optical Neural Network.* Laser & Photonics Reviews. Vol 16, July 2022. (IF:13.2) Media

- **Yingjie Li**, Ruiyang Chen, Weilu Gao, and Cunxi Yu. *Physics-aware Differentiable Discrete Codesign for Diffractive Optical Neural Networks.* The International Conference on Computer-Aided Design (ICCAD'22). Media

- **Yingjie Li**, Minhan Lou, Ruiyang Chen, Jichao Fan, Berardi Sensale Rodriguez, Weilu Gao and Cunxi Yu. *LightRidge: An Agile Co-designing Framework for Diffractive Optical Neural Networks.* First Workshop on Open-Source Computer Architecture Research (OSCAR) held in conjunction with ISCA (ISCA'49), June 2022.

- Ruiyang Chen, **Yingjie Li**, Minhan Lou, Jichao Fan, Yingheng Tang, Berardi Sensale-Rodriguez, Cunxi Yu, Weilu Gao. *Physics-aware Complex-valued Adversarial Machine Learning in Reconfigurable Diffractive All-optical Neural Network.* Conference on Lasers and Electro-Optics (CLEO'22).

- Jiaqi Yin, **Yingjie Li**, Cunxi Yu. *Combinatorial RL-based Scheduling for Pipelined Edge TPUs.* TinyML Research Symposium 2022 (TinyML'22).

**2021**

- **Yingjie Li**, Cunxi Yu. *Physical Adversarial Attacks of Diffractive Deep Neural Networks.* IEEE/ACM 58th Design Automation Conference (DAC'21).

- **Yingjie Li**, Ruiyang Chen, Berardi Sensale Rodriguez, Weilu Gao, and Cunxi Yu. *Multi-task Learning in Diffractive Deep Neural Networks via Hardware-software Co-design.* Spinger Nature *Scientific Reports*, 11, 11013 (2021).
- Walter Lau Neto, Matheus Trevisan Moreira, **Yingjie Li**, Luca Amaru, Cunxi Yu, and Pierre-Emmanuel Gaillardon. *SLAP: A Supervised Learning Approach for Priority Cuts Technology Mapping.* IEEE/ACM 58th Design Automation Conference (DAC'21).

## OPEN-SOURCED FRAMEWORKS

- Verilog-to-PyG: A framework for Graph Learning on RTL Designs. (V2PyG)
- LightRidge: Agile design framework for diffractive optical neural networks. (LightRidge)
- Gamora: Graph Learning based Symbolic Reasoning for Large-Scale Boolean Networks. (Gamora)
- RESPECT: Reinforcement Learning based Scheduling Framework (RESPECT)
- FlowTune: End-to-end Automatic Logic Optimization Exploration via Domain-specific Multi-armed Bandits. (FlowTune)

## SERVICES

**Organizing Committee**

- DAC Young Fellow 2023

**Journal Review**

- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)
- Nanophotonics

**Conference Review**

- DAC 2021, ICCAD 2022, DATE 2023, DAC 2023, ICCAD 2023.

## TEACHING EXPERIENCE

- **ECE/CS 3700 – Digital System Design**, Teaching Assistant, Fall'22, Fall'21
- **ECE/CS 5470/6470 CAD of Digital Circuits**, Teaching Assistant, Spring'22, Spring' 21

## REFERENCE LIST

- **Prof. Cunxi Yu**, Assistant Professor, University of Maryland, College Park, cunxiyu@umd.edu
- **Prof. Weilu Gao**, Assistant Professor, University of Utah, weilu.gao@utah.edu
- **Dr. Alan Mishchenko**, Full Researcher, University of California, Berkeley, alanmi@berkeley.edu
- **Prof. Zhiru Zhang**, Associate Professor, Cornell University, zhiruz@cornell.edu