

# Yongan (Luke) Zhang

832-566-7124 | [yzhang919@gatech.edu](mailto:yzhang919@gatech.edu) | [Personal Site](#)

## RESEARCH INTEREST

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- Software/Hardware Co-design for Efficient AI Solutions
- ML-enabled Hardware Design Automation

## EDUCATION

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- **Georgia Tech** Atlanta, GA, USA  
*PhD, Computer Science, Advisor: Prof. Yingyan Lin* Aug. 2023 – Present
- **Rice University** Houston, TX, USA  
*MS, Electrical and Computer Engineering, Advisor: Prof. Yingyan Lin* Jan. 2020 – May 2023
- **Rice University** Houston, TX, USA  
*BS, Electrical and Computer Engineering* Aug. 2015 – May 2019

## EXPERIENCES

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- **Research Intern, Meta** Mentor: Dr. Yuecheng Li  
*Reconfigurable hardware acceleration for VR mobile telepresence pipeline* May 2022 – Dec 2022
  - Designed the run-time reconfigurable architecture for improved hardware resource reuse
  - Designed the fine-grained operation scheduling for model-to-hardware mapping
  - Designed RTL-verified performance modeling for flexible DSE
  - Constructed design automation flow to auto generate the arch design and scheduling given Pytorch models
  - Worked with a hybrid of Catapult HLS, Vivado, RTL, C++ and Python for the whole flow
- **Ph.D. Intern, PNNL** Mentor: Dr. Ang Li  
*Multi-FPGA acceleration for scalable Graph Neural Networks implementation* Jan 2022 – May 2022
  - Designed the multi-FPGA architecture for large GNN acceleration
  - Implemented from arch design to final board deployment (fixed model-to-hardware mapping)
  - Worked with Xilinx HLS and Vivado for arch, and Pynq for deployment
- **System Engineer Intern, PHAZR, Inc.** Mentor: Dr. Robert Daniels  
*5G Millimeter wave systems for the licensed-bands in the 24-40 GHz* May 2018 – Aug 2018
- **Research Assistant, Rice University** Mentor: Dr. Joseph Cavallaro  
*Parallel Hardware Applications in Science and Technology (PHAST)* Jan 2017 – May 2018

## PUBLICATIONS

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1. Y. Fu\*, **Y. Zhang\***, Z. Yu\*, S. Li, Z. Ye, C. Li, C. Wan, Y. Lin, “GPT4AIGChip: Towards Next-Generation AI Accelerator Design Automation via Large Language Models”, *IEEE/ACM ICCAD (ICCAD)*, 2023.
2. Y. Zhao, **Y. Zhang**, Y. Fu, X. Ouyang, C. Wan, S. Wu, A. Banta, M. John, A. Post, M. Razavi, J. Cavallaro, B. Aazhang, Y. Lin, “e-G2C: A 0.14-to-8.31 uJ/Inference NN-based Processor with Continuous On-chip Adaptation for Anomaly Detection and ECG Conversion from EGM”, *IEEE Symposium on VLSI Technology and Circuits (VLSI)*, 2022.
3. H. You, Y. Zhao, Z. Yu, C. Wang, Y. Fu, J. Yuan, S. Wu, S. Zhang, **Y. Zhang**, C. Li, V. Boominathan, A. Veeraraghavan, Z. Li, Y. Lin, “EyeCoD: Eye Tracking System Acceleration via FlatCam-Based Algorithm and Accelerator Co-Design”, *IEEE/ACM International Symposium on Computer Architecture (ISCA)*, 2022.
4. H. You, T. Geng, **Y. Zhang**, A. Li, Y. Lin, “GCoD: Graph Convolutional Network Acceleration via Dedicated Algorithm and Accelerator Co-Design”, *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, 2022.
5. **Y. Zhang**, H. You, Y. Fu, T. Geng, A. Li, Y. Lin, “G-CoS: GNN-Accelerator Co-Search Towards Both Better Accuracy and Efficiency”, *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, 2021.
6. **Y. Zhang**, Y. Fu, W. Jiang, C. Li, H. You, M. Li, V. Chandra, Y. Lin, DIAN: “Differentiable Accelerator-Network Co-Search Towards Maximal DNN Efficiency”, *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, 2021.

7. **Y. Zhang**, A. Benta, Y. Fu, M. John, A. Post, M. Razavi, J. Cavallaro, B. Aazhang, Y. Lin, “RT-RCG: Neural Network and Accelerator Search Towards Effective and Real-time ECG Reconstruction from Intracardiac Electrograms”, *The ACM Journal on Emerging Technologies in Computing Systems (JETC)*, 2021.
8. Y. Fu, **Y. Zhang**, H. You, Y. Lin, “Auto-NBA: Efficient and Effective Search Over The Joint Space of Networks, Bitwidths, and Accelerators”, *The International Conference on Machine Learning (ICML)*, 2021.
9. Y. Fu, **Y. Zhang**, C Li, Z Yu, Y Lin, “A3C-S: Automated Agent Accelerator Co-Search towards Efficient Deep Reinforcement Learning”, *The 58th Design Automation Conference (DAC)*, 2021.
10. Y. Fu, Z. Yu, **Y Zhang**, Y Jiang, C Li, Y Liang, M Jiang, Z Wang, Y Lin, “InstantNet: Automated Generation and Deployment of Instantaneously Switchable-Precision Networks”, *The 58th Design Automation Conference (DAC)*, 2021.
11. T. Geng, C. Wu, **Y. Zhang**, C. Tang, C. Xie, H. You, M. Herbordt, Y. Lin, A. Li, “I-GCN: A Graph Convolutional Network Accelerator with Runtime Locality Enhancement through Islandization”, *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, 2021.
12. M. Li, Z. Yu, **Y. Zhang**, Y. Fu, Y. Lin, “O-HAS: Optical Hardware Accelerator Search for Boosting Both Acceleration Performance and Development Speed”, *IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, 2021.
13. C. Li, Z. Yu, Y. Fu, **Y. Zhang**, Y. Zhao, H. You, Q. Yu, Y. Wang, Y. Lin, “HW-NAS-Bench: Hardware-Aware Neural Architecture Search Benchmark”, *The International Conference on Learning Representations (ICLR)*, 2021.
14. H. You, X. Chen, **Y. Zhang**, C. Li, S. Li, Z. Liu, Z. Wang, Y. Lin, “ShiftAddNet: A Hardware-Inspired Deep Network”, *Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
15. Y. Zhao, C. Li, Y. Wang, P. Xu, **Y. Zhang**, Y. Lin, “DNN-Chip Predictor: A Multi-grained Graph-based Performance Simulator for DNN Accelerators”, *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2020.
16. P. Xu, Y. Zhao, C. Hao, X. Zhang, Z. Guan, **Y. Zhang**, Y. Wang, D. Chen, Y. Lin, “AutoDNNchip: An Automated DNN Chip Predictor and Builder for Both FPGAs and ASICs”, *ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)*, 2020.

## AWARDS

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| • Distinction in Research and Creative Work | May. 2019 |
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## TEACHING

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| • ELEC 327: Implementation of Digital Systems ( <i>Teaching Assistant</i> )      | 2018 Spring |
| • ELEC 539: Introduction to Communication Networks ( <i>Teaching Assistant</i> ) | 2020 Fall   |
| • ELEC 515: Embedded Machine Learning ( <i>Teaching Assistant</i> )              | 2020 Fall   |
| • ELEC 515: Embedded Machine Learning ( <i>Teaching Assistant</i> )              | 2021 Fall   |
| • ELEC 526: High Performance Computer Architecture ( <i>Teaching Assistant</i> ) | 2022 Spring |