BING-YUE WU

bingyuew@asu.edu | linkedin.com/in/bingyuewu

EDUCATION

Arizona State University Aug. 2023 – Aug. 2027
Ph.D. in Electrical Engineering *Tempe, Arizona*
National Taiwan University of Science and Technology (Taiwan Tech, NTUST) Sep. 2021 – Jul. 2023
M.S. in Electrical Engineering *Taipei, Taiwan*
National Taiwan University of Science and Technology (Taiwan Tech, NTUST) Sep. 2016 – June 2020
B.S. with major in Electrical Engineering and minor in Computer Science and Information Engineering *Taipei, Taiwan*

SKILLS

Programming Languages: C, C++, Python, Tcl
EDA Tools: OpenROAD, OpenSTA, Innovus, Genus, ICC2, Design Compiler, HSpice, Virtuoso, Calibre
Language Ability: Mandarin (Native), English (Fluent)

PUBLICATIONS

B.-Y. Wu and V. A. Chhabria, "**DALI-PD: Diffusion-based Synthetic Layout Heatmap Generation for ML in Physical Design**", *in Proc. ASP-DAC*, 2026.

B.-Y. Wu, U. Sharma, A. Rovinski, and V. A. Chhabria, "**OpenROAD Agent: An Intelligent Self-Correcting Script Generator for OpenROAD**", *in Proc. ICLAD*, 2025.

V. A. Chhabria, V. Gopalakrishnan, A. B. Kahng, S. Kundu, Z. Wang, **B.-Y. Wu**, and D. Yoon, "**IEEE CEDA DATC: Strengthening the Foundations of IC Physical Design and ML EDA Research**", *in Proc. ICCAD*, 2024.

V. A. Chhabria, **B.-Y. Wu**, U. Sharma, K. Kunal, A. Rovinski, and S. S. Sapatnekar, "**Generative Methods in EDA: Innovations in Dataset Generation and EDA Tool Assistants**", *in Proc. ICCAD*, 2024.

B.-Y. Wu, R. Liang, G. Pradipta, A. Agnesina, H. Ren, and V. A. Chhabria, "**2024 ICCAD CAD Contest Problem C: Scalable Logic Gate Sizing Using ML Techniques and GPU Acceleration**", *in Proc. ICCAD*, 2024.

U. Sharma*, **B.-Y. Wu***, S. R. D. Kankipati, V. A. Chhabria, and A. Rovinski, "**OpenROAD-Assistant: An Open-Source Large Language Model for Physical Design Tasks**", *in Proc. MLCAD*, 2024.

V. Gopalakrishnan, **B.-Y. Wu**, and V. A. Chhabria, "**ML-INSIGHT: Machine Learning for Inrush Current Prediction and Power Switch Network Improvement**", *in Proc. ISLPED*, 2024.

B.-Y. Wu, U. Sharma, S. R. D. Kankipati, A. Yadav, B. K. George, S. R. Guntupalli, A. Rovinski, and V. A. Chhabria, "**EDA Corpus: A Large Language Model Dataset for Enhanced Interaction with OpenROAD**", *in Proc. LAD*, 2024. **(Best Paper Nominated)**

V. A. Chhabria, W. Jiang, A. B. Kahng, R. Liang, H. Ren, S. S. Sapatnekar, and **B.-Y. Wu***, "**OpenROAD and CircuitOps: Infrastructure for ML EDA Research and Education**", *in Proc. VTS*, 2024. (primary author)

B.-Y. Wu, S.-Y. Fang, H.-W. Chang, and P. Wei, "**SpeedER: A Supervised Encoder-Decoder Driven Engine for Effective Resistance Estimation of Power Delivery Networks**", *in Proc. MLCAD*, 2022. **(Best Paper Award)**

PROJECTS

DALI-PD | Python Jan. 2025 – May 2025
- **GitHub link**: https://github.com/ASU-VDA-Lab/DALI-PD
- Developed the first generative AI-based approach for generating circuit heatmaps for ML model training in the EDA field.
- Open-sourced a dataset of 23,000 synthetic circuit heatmaps for ML model training.

OpenROAD-Agent | Python Jan. 2025 – Mar. 2025
- **GitHub link**: https://github.com/OpenROAD-Assistant/OpenROAD-Agent
- Open-sourced the framework that integrates the script-generating LLM with the physical design tool.

- Combined prompt engineering with the physical design tool's feedback to iteratively generate the tool script.

2024 ICCAD Contest Benchmark | Verilog/Tcl/Python/C++ May 2024 – Oct. 2024
- **GitHub link**: https://github.com/ASU-VDA-Lab/2024_ICCAD_Contest_Gate_Sizing_Benchmark
- Used C++ and SWIG to create Python APIs in OpenROAD, enabling gate sizing operations using OpenROAD's Python APIs.
- Developed Python scripts for examples and evaluations for the contest.
- Used EDA tools to synthesize netlists with the ASAP7 library and perform placement and routing.

OpenROAD-Assistant | Python Mar. 2023 – Jun. 2024
- **GitHub link**: https://github.com/OpenROAD-Assistant/OpenROAD-Assistant
- Open-sourced the LLM for generating scripts for the physical design tools and answering questions related to the physical design tools.

EDA-Corpus | Python Feb. 2024 – Mar. 2024
- **GitHub link**: https://github.com/OpenROAD-Assistant/EDA-Corpus
- Open-sourced the first dataset of physical design tool scripts for LLM-based physical design research.

2024 ASP-DAC Tutorial Talk | C++/Python Oct. 2023 – Jan. 2024
- **GitHub link**: https://github.com/ASU-VDA-Lab/ASP-DAC24-Tutorial
- Developed STA-related Python API for OpenROAD to provide flexibility in ML-EDA.
- Created demos on using the OpenROAD Python Interface and using NVIDIA's CircuitOps to build data pipelines for ML-based EDA research.
- Presented at 2024 ASP-DAC as a tutorial. (conference link)

CircuitOps | Tcl/Python Oct. 2023 – Jan. 2024
- **GitHub link**: https://github.com/NVlabs/CircuitOps
- Developed an ML-friendly data infrastructure to generate datasets for ML-EDA applications.

Work Experience

Arizona State University Aug. 2023 – Present
Graduate Research Assistant *Tempe, Arizona*
- Research the use of large language models in EDA tools.
- Conduct research on open-source EDA tools and generative AI-based EDA algorithms.

Synopsys Inc. Oct. 2021 – June 2022
Intern (Technical-Engineering) *Taipei, Taiwan*
- Researched a novel Machine Learning-based (ML) solution estimating the effective resistance of Power Delivery Networks in advanced VLSI designs to speed up runtime and improve the accuracy of ML-driven IR analysis tools.
- Responsible for designing the data pipeline, the ML model architecture, and the entire effective resistance estimation workflow.

Research Center for Information Technology Innovation (CITI), Academia Sinica Jul. 2020 – Nov. 2020
Full-time Research Assistant at Computational Finance and Data Analytics Lab *Taipei, Taiwan*
- Conducted research on a novel Transformer Encoder-based model with financial number category awareness, designing new pre-training and fine-tuning tasks to enhance its performance.
- Developed an Online Loan Application Recommender System for E.SUN Commercial Bank, achieving nearly 300% performance improvement. Responsibilities included workflow design, model development, and building Python APIs for industrial deployment.

Awards

MLCAD Student Travel Grant Sept. 2024
Ferdinand A. Stanchi Fellowship Aug. 2024
DAC Young Fellow Travel Grant Jun. 2024
MLCAD Student Travel Grant Sept. 2023
Fulton Fellows Fellowship Aug. 2023
Best Paper Award at MLCAD 2022 Sept. 2022

Professional Experience

Topic Chair of Problem C at 2024 ICCAD CAD Contest Oct. 2024
IEEE CEDA *Newark, New Jersey*

2024 ASP-DAC Tutorial Talk Jan. 2024
ACM SIGDA *Incheon, South Korea*