Dian-Lun Lin's Resume

Website: https://dian-lun-lin.github.io
GitHub: https://github.com/dian-lun-lin
Email: dianlun.lin@wisc.edu

EDUCATION

PhD – ECE Department, University of Wisconsin-Madison *Wisconsin, US*
MS – EECS Department, National Taiwan University *Taipei, Taiwan*
BS – EE Department, National Cheng Kung University *Tainan, Taiwan*

RESEARCH Interests:

Parallel and Heterogeneous Computing, Electronic Design Automation (EDA), Machine Learning

Research Achievements

I'm a fifth-year Ph.D. student at the Department of Electrical and Computer Engineering at the University of Wisconsin-Madison. During my prior PhD study, I have published four top-tier papers (DAC 2024, DAC 2023, ICPP 2022, and Euro-Par 2021) and one top-tier journal (IEEE TPDS 2022), all as **the first author**. I received **second place** in ACM/PACT Student Research Competition (SRC 2022). I also received the **champion award** in a research competition (IEEE HPEC Challenge 2020). I am a presenter at prominent C++ conferences (CppCon 2023, CppNow 2023, and CppCon 2021). I also give talks in MediaTek Research, Berkeley National Lab, and NVIDIA Research. My recent work focuses on building a CPU-GPU task programming system using modern C++ Coroutine and CUDA.

Open-Source Projects

Software	GitHub
SNIG: Accelerated Large Sparse Neural Network Inference using Task Graph Parallelism	https://github.com/dian-lun-lin/SNIG - Champion of 2020 IEEE HPEC Neural Network Challenge - Implemented in CUDA, CUDA Graph, and Taskflow
Taskflow: A General-purpose Parallel and Heterogeneous Task Programming System	https://github.com/taskflow/taskflow - 2nd Place of Open Source Software Award in ACM MM19 - Best Poster Award in 2018 C++ Conference (CppCon)
RTLflow: From RTL to CUDA - A GPU acceleration flow for RTL simulation with multiple testbenches	https://github.com/dian-lun-lin/verilator_rtlflow - Cooperated with NVIDIA Research - Accepted by ICPP 2022

Selected Awards

- Second place in ACM/PACT Student Research Competition (SRC), 2022
- Champion of the IEEE/MIT/Amazon HPEC Large Sparse Neural Network Challenge, 2020
- ACM ISPD Wafer-Scale Physics Modeling Contest – Honorable Mention, 2021
- ACM/IEEE DAC Young Student Fellowship, 2023
- ACM/IEEE DAC Young Student Fellowship, 2021
- ACM/IEEE DAC Young Student Fellowship, 2020
- Best Master Thesis Nomination, Department of EE, NTU, 2019
- Presidential Award, Department of EE, NCKU, Fall 2015

Work Experience

- Research Intern at NVIDIA (full time) — *NVIDIA, US*; May. 2022 – Aug. 2022
- Research Intern at NVIDIA (part time) — *NVIDIA, US*; Aug. 2021 – Nov. 2021
- Research Intern at NVIDIA (full time) — *NVIDIA, US*; May. 2021 – Aug. 2021
- Graduate Teaching Assistant for "Algorithms" — *National Taiwan University, Taiwan;* Sep. 2018 – Jan. 2019
  National Taiwan University, Taiwan; Sep. 2017 – Jan. 2018
- *Research Assistant at NTU AI center* — *National Taiwan University, Taiwan;* Sep. 2018 – Dec. 2018
- Web Backend Engineer at Edent — *Kaohsiung, Taiwan;* Jan. 2016 – July. 2017

Papers

- ***Dian-Lun Lin*** (co-first author), Boyang Zhang, Che Chang, Cheng-Hsiang Chiu, Bojue Wang, Wan Luan Lee, Chih-Chun Chang, Donghao Fang, and Tsung-Wei Huang, "G-PASTA: GPU Accelerated Partitioning Algorithm for Static Timing Analysis," ACM/IEEE Design Automation Conference (DAC), 2024
- Wan Luan Lee, ***Dian-Lun Lin***, Tsung-Wei Huang, Shui Jiang, Tsung-Yi Ho, Yibo Lin, and Bei Yu, "G-kway: Multilevel GPU-Accelerated k-way Graph Partitioner," ACM/IEEE Design Automation Conference (DAC), 2024
- Che Chang, Tsung-Wei Huang, ***Dian-Lun Lin***, Guannan Guo, and Shiju Lin, "Ink: Efficient Incremental k-Critical Path Generation," ACM/IEEE Design Automation Conference (DAC), 2024
- Shao-Hung Chan, Zhe Chen, ***Dian-Lun Lin***, Yue Zhang, Daniel Harabor, Tsung-Wei Huang, Sven Koenig, and Thomy Phan, "Anytime Multi-Agent Path Finding using Operator Parallelism in Large Neighborhood Search," International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS), 2024
- Tsung-Wei Huang, Boyang Zhang, ***Dian-Lun Lin***, and Cheng-Hsiang Chiu, "Parallel and Heterogeneous Timing Analysis: Partition, Algorithm, and System," ACM International Symposium on Physical Design (ISPD), 2024
- **Dian-Lun Lin**, Yanqing Zhang, Haoxing Ren, Shih-Hsin Wang, Brucek Khailany, and Tsung-Wei Huang, "GenFuzz: GPU-accelerated Hardware Fuzzing using Genetic Algorithm with Multiple Inputs", *ACM/IEEE Design Automation Conference (DAC),* 2023
- **Dian-Lun Lin**, Haoxing Ren, Yanqing Zhang, Brucek Khailany and Tsung-Wei Huang, "From RTL to CUDA: A GPU Acceleration Flow for RTL Simulation with Multiple Testbenches," *ACM International Conference on Parallel Processing (ICPP), 2022*
- **Dian-Lun Lin** and Tsung-Wei Huang, "Accelerating Large Sparse Neural Network Inference using GPU Task Graph Parallelism," *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 2022
- **Dian-Lun Lin** and Tsung-Wei Huang, "Enabling Efficient GPU Computation using Task Graph Parallelism," *European Conference on Parallel and Distributed Computing (Euro-Par),* 2021
- **Dian-Lun Lin** and Tsung-Wei Huang, "A Novel Inference Algorithm for Large Sparse Neural Network using Task Graph Parallelism", *IEEE High-performance and Extreme Computing Conference (HPEC),* 2020 (**champion award**)
- Cheng-Hsiang Chiu, **Dian-Lun Lin**, and Tsung-Wei Huang, "Programming Dynamic Task Parallelism for Heterogeneous EDA Algorithms (Invited paper)", *International Conference on Computer-Aided Design* (*ICCAD*), 2023
- Tsung-Wei Huang, **Dian-Lun Lin**, Chun-Xun Lin, and Yibo Lin, "Taskflow: A Lightweight Parallel and Heterogeneous Task Graph Computing System", *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 2022
- Cheng-Hsiang Chiu, **Dian-Lun Lin,** and Tsung-Wei Huang, "An Experimental Study of SYCL Task Graph Parallelism for Large-Scale Machine Learning Workloads", *International Workshop of Asynchronous Many-Task systems for Exascale (AMTE)*, 2021

- Tsung-Wei Huang, **Dian-Lun Lin**, Yibo Lin, and Chun-Xun Lin, "Taskflow: A General-purpose Parallel and Heterogeneous Task Programming System", *IEEE Transactions on Computer-aided Design of Integrated Circuits and Systems (TCAD)*, 2021

Talks

- "A Task Graph-based Programming System for CPU-GPU Heterogeneous Computing"
  - NERSC - GPUs for Science Day *California, US; 2023*
- "Taro: Task graph-based Asynchronous Programming Using C++ Coroutines"
  - CppCon (https://www.youtube.com/watch?v=UCejPLSCaoI) *Colorado, US; 2023*
- "An Introduction to C++ Coroutines Through a Thread Scheduling Demonstration"
  - CppNow (https://youtu.be/kIPzED3VD3w) *Colorado, US; 2023*
  - Berkeley National Lab *Remote, US; 2023*
- "cudaFlow: A Modern C++ Programming Model for GPU Task Graph Parallelism"
  - CppCon (https://youtu.be/-tIQbIhTAv8?t=2344) *Colorado, US; 2021*
- "Accelerating Hardware Design Verification: Exploring Simultaneous Execution of Multiple Stimuli with RTLflow and GenFuzz"
  - MediaTek Research *Remote, US; 2023*
- "G-Fuzz: GPU-accelerated hardware fuzzing"
  - NVIDIA Research *Remote, US; 2022*
- "RTLflow: A GPU acceleration flow for parallel RTL simulation"
  - NVIDIA Research *Remote, US; 2021*
  - ICPP https://youtu.be/00K8S3tNUSg *Remote, US; 2022*

Activities

- Program Committee in CppNow, 2024
- Program Committee in CppCon, 2023
- Program Committee in CppNow, 2023
- Program Committee in CppCon, 2022
- Invited reviewer of *IEEE Access Journal*, 2023
- Invited reviewer of *The Journal of Supercomputing*, 2023
- Invited C++ Coroutine posts by Rainer Grimm, 2023
  - https://www.modernescpp.com/index.php/a-concise-introduction-to-coroutines-by-dian-lun-li/
  - https://www.modernescpp.com/index.php/coroutines-a-scheduler-for-tasks-by-dian-lun-li/

Societies

- Utah Dance Contest – **Top 4** *Utah, US; 2021*
- University of Utah Taiwan Student Association Cooking Contest – **3rd place** *Utah, US; 2021*
- Invited dancer for 2019 Double Tenth Day parade – in front of **presidential palace** *Taipei, Taiwan; 2019*
- Invited dancer for 2017 Taiwan Power Company's year-end banquet *Taichung, Taiwan; 2017*
- Volunteer teacher at Tainan Jingliao Elementary School *Tainan, Taiwan; 2014*
- Cycling around Taiwan *Taiwan; 2012*

SKILLS

C++11/14/17/20, CUDA, Parallel Programming, Vim