

# Dian-Lun Lin

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## EDUCATION

### University of Wisconsin-Madison

US; 2023 Fall - Present

*PhD candidate in Computer Engineering*

Thesis: Task-parallel Heterogeneous Programming System for Logic Simulation, Advisor: Tsung-Wei Huang

### University of Utah

US; 2020 Spring – 2023 Summer

*PhD student in Computer Engineering*

Advisor: Tsung-Wei Huang

Teaching: Algorithms (2020 Fall)

### National Taiwan University

Taiwan; 2017 - 2019

*MS in Electrical Engineering*

Thesis: On the Analysis of Network Creation Game with Imperfect Monitoring, Advisor: Ho-Lin Chen

Teaching: Algorithms (2017 Fall & 2019 Spring)

### National Cheng Kung University

Taiwan; 2013 - 2017

*BS in Electrical Engineering*

## RESEARCH INTERESTS/SKILLS

Parallel and Heterogeneous Computing, Modern C++ concurrency, Scheduling, GPU-accelerated EDA

## SELECTED AWARDS

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

## WORK EXPERIENCE

- Research intern at NVIDIA Remote, US; May. 2022 – Aug. 2022
  - Topic: GenFuzz: GPU-accelerated Hardware Fuzzing using Genetic Algorithm
  - Team: Design Automation Research
  - Advisor: Mark Ren, Yan Zhang, and Brucek Khailany
- Research intern at NVIDIA Remote, US; May. 2021 – Nov. 2021
  - Topic: RTLflow: A GPU Acceleration Flow for RTL Simulation
  - Team: Design Automation Research
  - Advisor: Mark Ren, Yan Zhang, and Brucek Khailany

## SELECTED PAPERS

- G-PASTA: GPU Accelerated Partitioning Algorithm for Static Timing Analysis
  - **Dian-Lun Lin** (co-first), Boyang Zhang, Che Chang, Cheng-Hsiang Chiu, Bojue Wang, Wan Luan Lee, Chih-Chun Chang, Donghao Fang, and Tsung-Wei Huang ACM/IEEE Design Automation Conference (DAC), 2024
- GenFuzz: GPU-accelerated Hardware Fuzzing using Genetic Algorithm with Multiple Inputs
  - **Dian-Lun Lin**, Yanqing Zhang, Haoxing Ren, Shih-Hsin Wang, Brucek Khailany, and Tsung-Wei Huang ACM/IEEE Design Automation Conference (DAC), 2023
- From RTL to CUDA: A GPU Acceleration Flow for RTL Simulation with Multiple Testbenches
  - **Dian-Lun Lin**, Haoxing Ren, Yanqing Zhang, Brucek Khailany and Tsung-Wei Huang ACM International Conference on Parallel Processing (ICPP), 2022
- Accelerating Large Sparse Neural Network Inference using GPU Task Graph Parallelism
  - **Dian-Lun Lin** and Tsung-Wei Huang IEEE Transactions on Parallel and Distributed Systems (TPDS), 2022

- Taskflow: A Lightweight Parallel and Heterogeneous Task Graph Computing System
  - Tsung-Wei Huang, **Dian-Lun Lin**, Chun-Xun Lin, and Yibo Lin  
*IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 2022
- Enabling Efficient GPU Computation using Task Graph Parallelism
  - **Dian-Lun Lin** and Tsung-Wei Huang  
*European Conference on Parallel and Distributed Computing (Euro-Par)*, 2021
- A Novel Inference Algorithm for Large Sparse Neural Network using Task Graph Parallelism
  - **Dian-Lun Lin** and Tsung-Wei Huang  
(**Champion award**) *IEEE High-performance and Extreme Computing Conference (HPEC)*, 2020

## TALKS

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- NERSC - GPUs for Science Day *California, US; 2023*
  - Title: A Task Graph-based Programming System for CPU-GPU Heterogeneous Computing
- The C++ Conference *Colorado, US; 2023*
  - Title: Taro: Task Graph-based Asynchronous Programming Using C++ Coroutines
- Berkeley National Lab *Remote, US; 2023*
  - Title: An Introduction to C++ Coroutines Through a Thread Scheduling Demonstration
- The C++ Now Conference *Colorado, US; 2023*
  - Title: An Introduction to C++ Coroutines Through a Thread Scheduling Demonstration
- MediaTek Research *Remote, US; 2023*
  - Title: Accelerating Hardware Design Verification: Exploring Simultaneous Execution with RTLflow and GenFuzz
- NVIDIA Research *Remote, US; 2022*
  - Title: G-Fuzz: GPU-accelerated hardware fuzzing
- The C++ Conference *Colorado, US; 2021*
  - Title: cudaFlow: A Modern C++ Programming Model for GPU Task Graph Parallelism
- NVIDIA Research *Remote, US; 2021*
  - Title: RTLflow: A GPU acceleration flow for parallel RTL simulation

## ACADEMIC SERVICE

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- Invited reviewer of *Concurrency and Computation: Practice and Experience*, 2024
- Program Committee in CppNow, 2023 & 2024
- Invited reviewer of *IEEE Access Journal*, 2023
- Invited reviewer of *The Journal of Supercomputing*, 2023
- Program Committee in CppCon, 2022 & 2023

## OPEN-SOURCE PROJECTS

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- Taro: Task-based asynchronous programming system using C++ Coroutine
  - <https://github.com/dian-lun-lin/taro>
  - Presented in CppCon 2023
- Taskflow: A General-purpose Parallel and Heterogeneous Task Programming System
  - <https://github.com/taskflow/taskflow>
  - Core developer
- RTLflow: From RTL to CUDA - A GPU acceleration flow for RTL simulation with multiple inputs
  - [https://github.com/dian-lun-lin/verilator\\_rtlflow](https://github.com/dian-lun-lin/verilator_rtlflow)
  - Cooperated with NVIDIA Research
  - Second place at PACT Student Research Competition 2022
- 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

## INVITED POSTS

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- A Concise Introduction to Coroutines
  - <https://www.modernescpp.com/index.php/a-concise-introduction-to-coroutines-by-dian-lun-li/>
- Coroutines: A Scheduler for Tasks
  - <https://www.modernescpp.com/index.php/coroutines-a-scheduler-for-tasks-by-dian-lun-li/>