CHENG-HSIANG CHIU

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EDUCATION

University of Wisconsin, Madison, USA   Aug. 2023 - Present
Ph.D. student in Electrical and Computer Engineering

École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland   Sep. 2013 - Feb. 2016
Master of Science in Computer Science

National Chiao Tung University, Hsinchu City, Taiwan   Sep. 2005 - Aug. 2007
Master of Science in Communication Engineering

National Chung Cheng University, Chiayi City, Taiwan   Sep. 2001 - Jun. 2005
Bachelor of Science in Electrical Engineering

ONGOING RESEARCH

Pipeflow   Sep. 2021 - Present

Developing a task-parallel pipeline scheduling framework with token-dependency atop Taskflow.

syclFlow   Nov. 2020 - Present

Leveraging a task graph parallelism in SYCL runtime.

Taskflow/ High Performance Computing   Nov. 2020 - Present

Working on GPU and parallel programming for certain functions in Taskflow.

PAST RESEARCH

Energy efficient in-situ computing   Feb. 2019 - Dec. 2019

Implemented an energy efficient framework for the purpose of Arctic animal classification.

Power data analytics and visualization   May 2019 - Aug. 2019

Performed data cleansing and developed visualization framework of power data in Tromsø.

Component analysis of sands from Nigeria   Jan. 2018 - Dec. 2018

Developed classification techniques to obtain the components of sands and make suggestions if targeted
sands are feasible elements for bricks for constructions in Nigeria.

Estimation of nationality through sports in Twitter   Jan. 2018 - Jun. 2018

Analyzed twitter in UAE and estimated the proportion of nationalities based on sports preferences.

Protection against Data Profiling by Adversarial Cloud Applications Sep. 2015 - Jan. 2016

Designed and developed protection mechanisms for protecting users' data on personal cloud-storage
providers against data analysis by 3rd Party Apps.

Bootstrap recommender systems with the crowdsourcing   Feb. 2014 - Jan. 2015

Proposed an explicit technique to alleviate the impact caused by cold start in recommender systems by
taking advantages of crowdsourcing platform.

Random Walk
Feb. 2014 - Jun. 2014

Used Python to implement a web crawler to gather public events and activities in Europe which are used as references for recommending traveling routes to tourists.

High Value Cargoes' Networks
Feb. 2014 - Jun. 2014

Developed a framework for historians to add newly-found data and visualize the routes of high value cargoes during the period of the Venice Atlas.

WORK EXPERIENCE

U of Utah, Salt Lake City, USA
Aug. 2020 - Jul. 2023
Research Assistant

Worked on the development of parallel and heterogeneous computing libraries.

Intel, Texas, USA
May. 2022 - Aug. 2022
Software Intern

Worked on the development of implicit SYCL Graph.

Cadence, Texas, USA
May. 2021 - Aug. 2021
Software Intern

Accelerated the execution time of the buffer insertion implementation by 16%.

The Arctic University of Norway, Tromsø, Norway
Feb. 2019 - Dec. 2019
Doctoral Researcher

Implemented an energy efficient framework which is used to classify Arctic wild animals in-situ for the purpose of investigating in the impact of global warning over animals living in Arctic tundra.

Khalifa University, Abu Dhabi, United Arab Emirates
Jan. 2018 - Nov. 2018
Assistance Researcher

Automated and parallelized python-meep for materials modeling at the nanoscale, process measured data of self-grown graphen, develop data visualization frameworks and apply autoencoder technique to speed up simulations.

CERN, Genève, Switzerland
Mar. 2015 - Aug. 2015
Software Developer

Developed softwares to discover devices on the network, perform consistency checking with the installation databases, and monitor the status of the data acquisition network.

National Chiao Tung University, Hsinchu, Taiwan
Jan. 2009 - Jun. 2013
Research Assistant

· Constructed a data center for storing brain images in a distant health care project.
· Designed an load balancing algorithm to streaming videos.
· Constructed wireless sensor networks to monitor structural health, such as bridges.
· Coordinated and built surveillance systems in a campus and gadgets to guide blind students.
· Constructed a multimedia streaming system and deployed it in a vision-based intelligent environment.

SKILLS

Languages	Mandarin (native), English (fluent)
Computer Languages	C/C++, Python, Javascript, HTML, SQL
Unit Test	doctest
Profiler	gprof, perf
Programming Model	Taskflow, SYCL, oneTBB (pipeline), CUDA, OpenMP,Cilk,Pytorch

PUBLICATION

Semester Project Report

· Cheng-Hsiang Chiu, "Bootstrapping recommender systems with the crowdsourcing II," École Polytechnique Fédérale de Lausanne, 2015.

· Cheng-Hsiang Chiu, "Bootstrapping recommender systems with the crowdsourcing," École Polytechnique Fédérale de Lausanne, 2014.

Master Thesis

· Cheng-Hsiang Chiu, "Protection against Data Profiling by Adversarial Cloud Applications," Master Thesis, Department of Computer Science, École Polytechnique Fédérale de Lausanne, 2016.

· Cheng-Hsiang Chiu, "Process Control in Streaming Server," Master Thesis, Department of Communication Engineering, National Chiao Tung University, 2007.

Journal Papers

· Yu-Cheng Chiou, Tuza Adeyemi Olukan, Mariam Ali Almahri, Harry Apostoleris, **Cheng-Hsiang Chiu**, Chia-Yun Lai, Jin-You Lu, Sergio Santos, Ibraheem Almansouri, and Matteo Chiesa, "Direct Measurement of the Magnitude of van der Waals interaction of Single and Multilayer Graphene," *ACS LANGMUIR*, 2018.

Conference Papers

· Wan-Luan Lee, Dian-Lun Lin, **Cheng-Hsiang Chiu**, Ulf Schlichtmann, and Tsung-Wei Huang, "HyperG: Multilevel GPU-Accelerated k-way Hypergraph Partitioner," *IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, 2025.

· Boyang Zhang, Che Chang,**Cheng-Hsiang Chiu**, Dian-Lun Lin, Yang Sui, Chih-Chun Chang, Yi-Hua Chung, Wan-Luan Lee, Zizheng Guo, Yibo Lin, and Tsung-Wei Huang, "iTAP: An Incremental Task Graph Partitioner for Task-parallel Static Timing Analysis," *IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, 2025.

· Che Chang, Boyang Zhang, **Cheng-Hsiang Chiu**, Dian-Lun Lin, Yi-Hua Chung, Wan-Luan Lee, Zizheng Guo, Yibo Lin, and Tsung-Wei Huang, "PathGen: An Efficient Parallel Critical Path Generation Algorithm," *IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, 2025.

· **Cheng-Hsiang Chiu**, Chedi Morchdi, Yi Zhou, Boyang Zhang, Che Chang, and Tsung-Wei Huang, "Reinforcement Learning-generated Topological Order for Dynamic Task Graph Scheduling", *IEEE High-performance and Extreme Computing Conference (HPEC)*, 2024.

· **Cheng-Hsiang Chiu** and Tsung-Wei Huang, "An Experimental Study of Dynamic Task Graph Parallelishm for Large-Scale Circuit Analysis Workloads", *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, 2024.

· Che Chang, **Cheng-Hsiang Chiu**, Boyang Zhang, and Tsung-Wei Huang, "Incremental Critical Path Generation for Dynamic Graphs," *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, 2024.

· Boyang Zhang, Dian-Lun Lin, 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.

· 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.

· **Cheng-Hsiang Chiu**, Zhicheng Xiong, Zizheng Guo, Tsung-Wei Huang, and Yibo Lin, "An Efficient Task-parallel Pipeline Programming Framework," *ACM International Conference on High-performance Computing in Asia-Pacific Region (HPC Asia)*, 2024.

· Chedi Morchdi, **Cheng-Hsiang Chiu**, Yi Zhou, and Tsung-Wei Huang, "A Resource-efficient Task Scheduling System using Reinforcement Learning," *IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, 2024.

· **Cheng-Hsiang Chiu**, Dian-Lun Lin, and Tsung-Wei Huang, "Programming Dynamic Task Parallelism for Heterogeneous EDA Algorithms," *IEEE/ACM International Conference on Computer-aided Design (ICCAD)*, 2023.

· **Cheng-Hsiang Chiu** and Tsung-Wei Huang, "Composing Pipeline Parallelism using Taskflow Control Graph," *ACM High-Performance Parallel and Distributed Computing (HPDC)*, 2022.

· **Cheng-Hsiang Chiu** and Tsung-Wei Huang, "Efficient Timing Propagation with Simultaneous Structural and Pipeline Parallelisms," *ACM/IEEE Design Automation Conference (DAC)*, 2022.

· **Cheng-Hsiang Chiu**, Tsung-Wei Huang, Zizheng Guo, and Yibo Lin, "Pipeflow: An Efficient Task-Parallel Pipeline Programming Framework using Modern C++," https://arxiv.org/abs/2202.00717.

· **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 European Conference on Parallel and Distributed Computing (Euro-Par)*, 2021.

· Der-Cherng Liaw, **Cheng-Hsiang Chiu**, Chia-Wei Yeh, Chia-Ming Chang, and Hsiao-Jen Hsieh," A Server Load Balancing Design for Peer-To-Peer Network," *International Conference on Computers, Communications, Control and Automation*, 2011.

· Der-Cherng Liaw, Chia-Wei Yeh, **Cheng-Hsiang Chiu**, Chia-Ming Chang, and Hsiao-Jen Hsieh, "A Load Balancing Scheme for Web Server Design," *International Conference on System Science and Engineering*, 2011.

· Der-Cherng Liaw, Yi-Hung Hsieh, Jing-Hong Lai, and **Cheng-Hsiang Chiu**, "A Network Topology Design for Structural Health Monitoring," *Asian Control Conference*, 2011.

· Der-Cherng Liaw, Jing-Hong Lai, **Cheng-Hsiang Chiu**, and Jia-Hong Liao, "A Wireless Sensor Network Platform for Indoor Surveillance System," *International Conference on System Science and Engineering*, 2011.

· **Cheng-Hsiang Chiu**, Pang-Chan Hung, Jen-Hui Chuang, and Shing-Lu Huang, "Object Tracking under Sensing Lighting Equipments," *IEEE Conference on Industrial Electronics and Applications*, 2010.

· Yi-Yuan Chen, Yuan-Yao Tu, **Cheng-Hsiang Chiu**, and Yong-Sheng Chen, "An Embedded System for Vehicle Surrounding Monitoring," *IEEE Conference on Power Electronics and Intelligent Transportation System*, 2009.