

# CHENG-HSIANG CHIU

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## EDUCATION

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<b>University of Wisconsin</b> , Madison, USA <i>Ph.D. student in Electrical and Computer Engineering</i>	Aug. 2023 - Present
<b>École Polytechnique Fédérale de Lausanne</b> , Lausanne, Switzerland <i>Master of Science in Computer Science</i>	Sep. 2013 - Feb. 2016
<b>National Chiao Tung University</b> , Hsinchu City, Taiwan <i>Master of Science in Communication Engineering</i>	Sep. 2005 - Aug. 2007
<b>National Chung Cheng University</b> , Chiayi City, Taiwan <i>Bachelor of Science in Electrical Engineering</i>	Sep. 2001 - Jun. 2005

## ONGOING RESEARCH

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<b>Pipeflow</b> Developing a task-parallel pipeline scheduling framework with token-dependency atop Taskflow.	Sep. 2021 - Present
<b>syclFlow</b> Leveraging a task graph parallelism in SYCL runtime.	Nov. 2020 - Present
<b>Taskflow/ High Performance Computing</b> Working on GPU and parallel programming for certain functions in Taskflow.	Nov. 2020 - Present

## PAST RESEARCH

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<b>Energy efficient in-situ computing</b> Implemented an energy efficient framework for the purpose of Arctic animal classification.	Feb. 2019 - Dec. 2019
<b>Power data analytics and visualization</b> Performed data cleansing and developed visualization framework of power data in Tromsø.	May 2019 - Aug. 2019
<b>Component analysis of sands from Nigeria</b> Developed classification techniques to obtain the components of sands and make suggestions if targeted sands are feasible elements for bricks for constructions in Nigeria.	Jan. 2018 - Dec. 2018
<b>Estimation of nationality through sports in Twitter</b> Analyzed twitter in UAE and estimated the proportion of nationalities based on sports preferences.	Jan. 2018 - Jun. 2018
<b>Protection against Data Profiling by Adversarial Cloud Applications</b> Designed and developed protection mechanisms for protecting users' data on personal cloud-storage providers against data analysis by 3rd Party Apps.	Sep. 2015 - Jan. 2016
<b>Bootstrap recommender systems with the crowdsourcing</b> Proposed an explicit technique to alleviate the impact caused by cold start in recommender systems by taking advantages of crowdsourcing platform.	Feb. 2014 - Jan. 2015

**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**

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**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 warming 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**

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

## PUBLICATION

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### 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 Parallelism 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.