**Ching (Jason) Chang**

Crafting AI for the 22nd century

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Education

**National Yang Ming Chiao Tung University** Hsinchu, Taiwan

Doctor of Philosophy, Computer Science (Advisor: Prof. Wen-Chih Peng) Sep. 2021 – Expected Mar. 2026

• Research Topics: Time-Series Analysis, Large Foundation Models, Causal Discovery, Representation Learning

• GPA: 4.25/4.3, 3 publications, 4 scholarships, 1 competition award, 3 academic services

**University of California, Los Angeles** Los Angeles, USA

Visiting Researcher in Scalable Analytics Institute (Advisor: Prof. Wei Wang) Expected Mar. 2025 – Expected Mar. 2026

• Research Topics: Time-Series Analysis, Large Foundation Models, Natural Language Processing

**National Chiao Tung University** Hsinchu, Taiwan

Master of Science, Computer Science and Engineering (Advisor: Prof. Wen-Chih Peng) Sep. 2016 – Sep. 2018

• Research Topics: Time-Series Analysis, Motif Discovery, Root Cause Analysis

• GPA: 3.56/4.0, 1 publication, 2 industry-academia collaboration projects

**National Chiao Tung University** Hsinchu, Taiwan

Bachelor of Science, Electrical and Computer Engineering Sep. 2012 – Jun. 2016

• Research Topics: Game Script Automation

• GPA: 3.06/4.0, 2 projects

Work Experience

**Research Scientist | GoEdge.ai** Hsinchu, Taiwan

Time-Series Analysis ⋅ Large Foundation Models ⋅ Causal Discovery Jan. 2021 – Present

• Designed a multivariate time-series analysis platform for manufacturing data

• Developed a forecasting module using large language models to enhance predictive accuracy

• Created a segmentation module with prompting to leverage label information during inference

**Machine Learning Engineer | TSMC** Hsinchu, Taiwan

Root Cause Analysis Jul. 2019 – Dec. 2020

• Used ensemble models to analyze sensor data of wafers and found root causes to increase yield of manufacturing wafers

• Developed the core kernel function of the defect-mining platform

• Integrated and processed different data sources and designed analysis algorithms for heterogeneous data

**Machine Learning Engineer (Intern) | EPISTAR** Hsinchu, Taiwan

Root Cause Analysis Apr. 2018 – Sep. 2018

• Analyzed machine sensor data, incorporating the diversity of states/stages in the manufacturing process.

• Evaluated correlations at various time-lags separately to enhance understanding of machine sensor data relationships.

**Software Learning Engineer (Intern) | MediaTek** Hsinchu, Taiwan

Multimedia Firmware Jul. 2016 – Aug. 2016

• Maintained camera firmware: updated, debugged, and added tests to enhance reliability and code coverage.

Selected Projects

**Neural Granger Causal Discovery for Root Cause Analysis in Microservices** [[paper]](https://arxiv.org/abs/2402.01140) [[code]](https://github.com/zmlin1998/RUN) Sep. 2022 – Sep. 2023

• Used a self-supervised framework with contrastive learning for root cause analysis in microservices

• Used Granger causal discovery to construct causal graph between multivariate time-series

• Applied GrootRank to identify root causes of trigger points

**Detecting Machine Causal Anomalies** [[paper]](https://arxiv.org/abs/2301.07281) [[code]](https://github.com/blacksnail789521/Detecting_Machine_Causal_Anomalies) Apr. 2018 – Sep. 2018

• Used machine learning techniques to find the cause of anomalies

• Created profile (correlation network) for machine and then determined whether there are causal

• Used parallelization to reduce computing time

**PM2.5 Monitoring System** [[code]](https://github.com/blacksnail789521/PM_two_point_five_Monitoring_System) Oct. 2016 – Dec. 2017

• Created an interactive website that can self-monitor PM2.5 sensors in real time

• Displayed the basic readings of each sensor and used color coding to display the indicator level

• Created profiles (average, extremum, motif) for each sensor to perform subsequent analysis more easily (e.g., path detection and change point detection)

**Earning Currency in League of Legends** [[code]](https://github.com/blacksnail789521/Earning_Currency_in_League_of_Legends) Sep. 2015 – Feb. 2017

• Implemented the script to earn game currency by automatically playing against bots

• Automated all operations within the game (including pairing systems, determining the position of enemies and towers, returning to the base when blood volume is too low, etc.)

• Used locks to avoid having multiple accounts entering the same game at the same time

• Automatically modified MAC address

**Rotating Runestones for Tower of Saviors** [[code]](https://github.com/blacksnail789521/Rotating_Runestones_for_Tower_of_Saviors) Sep. 2014 – Jan. 2015

• Used breadth-first search to plan best rotation path

• Supported runestones to rotate diagonally, and could set the rotation time, minimum number of combos, maximum number of steps

• Used linked lists to store rotation records of runestones

Publications

**Ching Chang**, Wei-Yao Wang, Wen-Chih Peng, Tien-Fu Chen, ”LLM4TS: Aligning Pre-Trained LLMs as Data-Efficient Time-Series Forecasters”, under review [[preprint]](https://arxiv.org/abs/2308.08469).

**Ching Chang**, Chiao-Tung Chan, Wei-Yao Wang, Wen-Chih Peng, Tien-Fu Chen, ”TimeDRL: Disentangled Representation Learning for Multivariate Time-Series”, ICDE 2024 [[paper]](https://arxiv.org/abs/2312.04142).

Zheng-Ming Lin, **Ching Chang**, Wei-Yao Wang, Kuang-Da Wang, Wen-Chih Peng, ”Root Cause Analysis In Microservice Using Neural Granger Causal Discovery”, AAAI 2024 [[paper]](https://arxiv.org/abs/2402.01140).

**Ching Chang**, Wen-Chih Peng, “Detecting and Ranking Causal Anomalies in End-to-End Complex System” [[preprint]](https://arxiv.org/abs/2301.07281).

Competitions

Feb. 2023 **4th Place in License Plate Recognition and Parking Management**, TSMC IT CareerHack 2023, [[website]](https://www.tsmc.com/static/english/careers/2023Careerhack/index.html), [[code]](https://github.com/blacksnail789521/TSMC_parking_lot) Taipei, Taiwan

Awards

Jun. 2024 **International Conference Scholarship**, National Yang Ming Chiao Tung University Taipei, Taiwan

May. 2024 **International Conference Scholarship**, National Science and Technology Council Taipei, Taiwan

Feb. 2024 **AAAI Student Scholarship**, 38th AAAI Conference on Artificial Intelligence Vancouver, Canada

Feb. 2022 **Xin Miao Key Technology Doctoral Scholarship**, Xin Miao Education Foundation Taipei, Taiwan

Sep. 2021 **Industry-Academia Cooperative PhD Project Scholarship**, Ministry of Education Republic of China (Taiwan) Taipei, Taiwan

Academic Services

**Reviewer | KDD’24**

**External Reviewer | ICDE’24**

**Student Volunteer | AAAI’24**

**Speaker | 2023 LLM Industry-Academia Technical Exchange Conference, National Center for High-Performance Computing** Aug. 2023

Topic: Time-Series Analysis with LLMs [[website](https://nycuaib.web.nycu.edu.tw/)], [[slides](https://docs.google.com/presentation/d/1KwBT4BMoIjCcTaBFEBmhVW0y8rBRAoAH/edit?usp=sharing&ouid=102526612289511924674&rtpof=true&sd=true)]

• Shared the stage with Hung-Yi Lee and Hsiang-Tsung Kung

• Delivered a talk on time-series analysis using large language models (LLMs)

• Discussed the application of LLMs in analyzing time-series data and their potential benefits in various industries

Technical Skills

**Programming Languages (in order of familiarity):**

Python (PyTorch, TensorFlow), C++, Java

**Language:**

English: C1 (IELTS: 7.5, TOEIC: 875)

Mandarin Chinese: Native