Che-Ping Tsai

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Research Interest

Seeking full-time AI research roles starting **Jan/Feb 2026**, with a focus on **post-training of large language models, embedding models, and retrieval-augmented generation**. PhD research on principal algorithms for representation learning [1]-[3], and interpretability [5]-[7]; internship experience in fine-tuning large language models for tabular data [4] and explainable recommender systems [6].

Education

Carnegie Mellon University Aug. 2020 - Present
Ph.D., Machine Learning, advised by Prof. Pradeep Ravikumar. *Pittsburgh, PA*

- Representation learning [1]-[3], LLMs for tabular data [4], interpretability [5]-[7], and robust statistics [8].

National Taiwan University Sep. 2017 - Jan. 2020
M.S., Computer Science, advised by Prof. Hung-Yi Lee and Lin-Shan Lee. *Taipei, Taiwan*

- Multi-label classification [9]-[10] and automatic speech recognition [11]-[12].

National Taiwan University Sep. 2013 - June 2017
B.S., double major in Electrical Engineering and Mathematics. *Taipei, Taiwan*

Competition Awards

Silver Medal, 52nd International Mathematical Olympiad (IMO). Amsterdam, Netherland, 2011

- **Ranked 1st** in the national training camp at the age of 16.
- Ranked top 10% among 544 international representatives from 101 countries.

Silver Medal, 53rd International Mathematical Olympiad (IMO). Mar del Plata, Argentina, 2012

Top 30, National Training Camp for the International Olympiad in Informatics (IOI). Taiwan, 2013

Work Experience

Amazon AWS May. 2024 – Aug. 2024
Applied scientist intern, advised by Phillip Wallis and Wei Ding *Seattle, WA*

- Tabular anomaly detection with LLMs, paper accepted by ICLR 2025 [4].

Amazon Search May. 2022 – Aug. 2022
Applied scientist intern, advised by Hsiang-Fu Yu and Cho-Jui Hsieh *Palo Alto, CA*

- Explaining recommender system with training samples, paper accepted by ICML 2023 [6].

Microsoft, Taiwan AI center Mar. 2020 – July 2020
Research intern, supervised by Bo-June (Paul) Hsu *Taipei, Taiwan*

- Working with MSRA and MSR on receipt understanding.

Publications (Sorted by dates)

[1] **Che-Ping Tsai***, Burak Varici*, Ritabrata Ray, Nicholas Boffi, Pradeep Ravikumar. Eigenfunction Extraction for Ordered Representation Learning, AISTATS 2026(under submssion)[preprint].

[2] Burak Varici, **Che-Ping Tsai**, Runtian Zhai, Hugo Contant, Arnav Mantro, Zico Kolter, Pradeep Ravikumar. Mixing Contexts for Representation Learning, AISTATS 2026(under submssion).

[3] Runtian Zhai*, Kai Yang*, **Che-Ping Tsai***, Burak Varici*, Zico Kolter, Pradeep Ravikumar. Contextures: Representations from Contexts, ICML 2025. [paper]

[4] **Che-Ping Tsai**, Ganyu Teng, Phillip Wallis, Wei Ding. AnoLLM: Large Language Models for Tabular Anomaly Detection, ICLR 2025. [paper] [code]

[5] **Che-Ping Tsai**, Chih-Kuan Yeh, Pradeep Ravikumar. Sample based Explanations via Generalized Representers, Neurips 2023. [paper]

[6] **Che-Ping Tsai**, Jiong Zhang, Hsiang-Fu Yu, Eli Chien, Cho-Jui Hsieh, Pradeep Ravikumar, Representer Point Selection for Explaining Regularized High-dimensional Models, ICML 2023. [paper] [code]

[7] **Che-Ping Tsai**, Chih-Kuan Yeh, Pradeep Ravikumar, Faith-Shap: The Faithful Shapley Interaction Index. Journal of Machine Learning Research (JMLR), Vol. 24 (94), pages 1-42, 2023. [paper][code]

[8] **Che-Ping Tsai**, Adarsh Parasad, Sivaraman Balakrishnan, Pradeep Ravikumar, Heavy-tailed Streaming Statistical Estimation, AISTATS 2022 **(Oral)**. [paper]

[9] **Che-Ping Tsai**, Hung-Yi Lee Order-free Learning Alleviating Exposure Bias in Multi-label Classification, AAAI 2020. [paper] [code]

[10] **Che-Ping Tsai**, Hung-Yi Lee. Adversarial Learning of Label Dependency: A Novel Framework for Multi-class Classification, ICASSP 2019 [paper]

[11] Kuan-Yu Chen, **Che-Ping Tsai**, Da-Rong Liu, Hung-Yi Lee, Lin-shan Lee. Completely Unsupervised Phoneme Recognition By A Generative Adversarial Network Harmonized with Iteratively Refined Hidden Markov Models, Interspeech 2019 [paper][code1] [code2]

[12] **Che-Ping Tsai***, Yi-Lin Tuan*, Hung-Yi Lee, Lin-shan Lee. Transcribing Lyrics from Commercial Song Audio: the First Step towards Singing Content Processing, ICASSP 2018 [paper][code]

Selected Honors

NeurIPS 2023 Scholar Award — New Orleans, 2023

Study Abroad Scholarship (US$16000), Ministry of Education — Taiwan, 2021

Talks

Speaker, Sample-based Explanations for Recommender Systems. — Amazon AWS (Jun, 2024)

Speaker, Faith-Shap: The Faithful Shapley Interaction Index. — CMU MLD Ph.D. Lunch (Nov 2024)

Invited Talk, Sample-based Explanations for Recommender Systems. — AI TIME (Jun 2023)

Oral presentation, Heavy-tailed Streaming Statistical Estimation. — AISTATS 2022

Teaching Experience

Teaching Assistant , Probabilistic Graphical Models (10708) — CMU, Fall 2022

Teaching Assistant , Probabilistic Graphical Models (10708) — CMU, Spring 2022

Teaching Assistant , Advanced Deep Learning [CSIE7430] — NTU, Spring 2018

Teaching Assistant , Machine Learning [EE5184] — NTU, Spring 2017

Professional Service and Skills

Committee: CMU MLD Graduate Admissions Committee (2021, 2022, 2023, 2024)

Reviewer: Neurips 2023/2024/2025, ICLR 2025, ICML 2024, AISTATS 2022/2023/2024/2025, JMLR

Selected Coursework: Intermediate Stats (A-), advanced statistical theory (A), convex optimization (A+), probabilistic graphical models (A), advanced ML theory and methods (A), and advanced intro to ML (A), operating systems (A+)

Programming Language: Python, PyTorch, Git, Transformers, Distributed Training, LaTex, Bash Scripts

Language Mandarin (native), English (fluent)