

Feng-Ting Liao

MediaTek Research | Taipei, Taiwan

PERSONAL DATA

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RESEARCH INTEREST

Large Language Models, Deep Reinforcement Learning, Meta-Learning, Speech Processing, Diffusion Models, Generative Models, Computer Vision

APPLICATION DOMAINS

Large foundation models, e.g. LLMs, for digital assistants and IC design; Deep reinforcement learning for chip design; Computer vision for event detection

Programming languages: Python, C++, Shell (proficient); SQL (basic)

Technologies: PyTorch, JAX, CUDA, NumPy, Pandas, Docker, Kubernetes, Git, Jenkins, AWS, GCP, Tableau

WORK EXPERIENCE

MediaTek Research

Taipei, Taiwan

Senior Research Scientist

Nov 2020 - Present

- Co-creator of Breeze and BreeXe, the state-of-art LLM in Traditional Chinese.
 - Contributed to the full cycle of LLM creation, including data collection/processing, pre-training, post-training, evaluation, marketing, and productization of Breeze and BreeXe.
 - Open-sourced TCEval, the first comprehensive language model benchmark in Traditional Chinese; RAD-Bench, the first benchmark on retrieval augmented dialogues; Generative Fusion Decoding, an algorithmic framework for shallow fusing speech recognition model and LLM without re-training.
 - Productised BreeXe through cloud API and on-premises deployment to the Traditional Chinese market.
- Project lead of deep reinforcement learning for floor planning in chip design.
 - Designed, prototyped, and delivered deep reinforcement learning agents based on graph neural network and Transformer to solve floor-planing in chip top design.
 - Coordinated cross-departmental effort for algorithm integration and tool evaluation on chip design cases; cross-institution effort for building shaping and routing tools for RL environments.
- Research publications in Large Language Model, Diffusion Models, Meta-Learning, Natural-Language-Processing, and Speech Recognition at conferences such as ICML, EACL, and ASRU.
- Mentor for interns on algorithm prototyping and research publications; coordinator of staff hiring, cross-departmental reading groups, and lab compute infrastructure.

Umbo Computer Vision

Taipei, Taiwan

AI Research Engineer / Research and computer vision team

Mar 2019 - Feb 2020

- Architected a vehicle detection API for realtime surveillance cameras with research and product teams; proposed and implemented algorithmic optimization that increased 350% service speed and reduced 90% service cost for Umbo cameras over AWS.

University of Oxford

Oxford, UK

Postdoctoral Research Assistant / Department of Physics

Jan - Dec 2018

DPhil Researcher / Department of Physics

Oct 2013 - Jan 2018

- Contributed to the first result of the world's largest detector for direct detection of dark matter.
- Led the Oxford team in developing and delivering sensors worth ~£50K to LZ and the investigation into applying machine learning to dark matter research. Designed a state-of-the-art monitoring system for the LZ detector and collaborated with ~20 researchers in developing the detector's time projection chamber.

EDUCATION

DPhil in Particle Physics, University of Oxford	2013 - 2018
<i>Supervisor: Professor Hans Kraus</i>	
B.Sc. in Electrophysics, National Chiao Tung University	2008 - 2012

MENTORSHIP

Tzu-Lin Kuo (M.S student at NTU CSIE)	May - June, 2024
Yung-Chieh Chan (M.S student at Stanford CS)	April - June, 2023
Ren-Chu Wang (M.S student at GeorgiaTech CS)	Jan - June, 2022
Chien-Yi Yang (PhD student at UCSD EE)	Jan - June, 2022

PUBLICATIONS

RAD-Bench: Evaluating Large Language Models Capabilities in Retrieval Augmented Dialogues

Tzu-Lin Kuo, Feng-Ting Liao, Mu-Wei Hsieh, Fu-Chieh Chang, Po-Chun Hsu, Da-Shan Shiu, *in preparation*

Let's Fuse Step by Step: A Generative Fusion Decoding Algorithm with LLMs for Multi-modal Text Recognition

Chan-Jan Hsu, Yi-Chang Chen, Feng-Ting Liao, Pei-Chen Ho., Yu-Hsiang Wang, Po-Chun Hsu, Da-Shan Shiu, *Preprint, 2024*

[\[paper\]](#)[\[code\]](#)

Breeze-7B Technical Report

MediaTek Research, *Technical Report, 2024*

[\[paper\]](#)[\[model weight\]](#)

Image generation with shortest path diffusion

Ayan Das, Stathi Fotiadis, Anil Batra, Farhang Nabiei, Feng-Ting Liao, Sattar Vakili, Da-shan Shiu, Alberto Bernacchia, *International Conference on Machine Learning, 2024*

[\[paper\]](#)[\[code\]](#)

Zero-Shot Domain-Sensitive Speech Recognition with Prompt-Conditioning Fine-Tuning

Feng-Ting Liao, Yung-Chieh Chan, Yi-Chang Chen, Chan-Jan Hsu, Da-shan Shiu, *IEEE Automatic Speech Recognition and Understanding Workshop (ASRU), 2023*

[\[paper\]](#)[\[code\]](#)

Advancing the evaluation of traditional chinese language models: Towards a comprehensive benchmark suite

Chan-Jan Hsu, Chang-Le Liu, Feng-Ting Liao, Po-Chun Hsu, Yi-Chang Chen, Da-shan Shiu, *Preprint, 2023*

[\[paper\]](#)[\[code\]](#)

Meta-learning with MAML on trees

Jezabel R Garcia, Federica Freddi, Feng-Ting Liao, Jamie McGowan, Tim Nieradzik, Da-shan Shiu, Ye Tian, Alberto Bernacchia, *EACL Workshop on Domain Adaptation for NLP, 2021*

[\[paper\]](#)

First dark matter search results from the LUX-ZEPLIN (LZ) experiment

J Aalbers et al. (The LZ Collaboration), *Physical review letters 131 (4), 041002, 2023*

[\[paper\]](#)

Projected WIMP sensitivity of the LUX-ZEPLIN dark matter experiment

DS Akerib et al. (The LZ Collaboration), *Physical Review D 101 (5), 052002, 2020*

[\[paper\]](#)

LUX-ZEPLIN (LZ) Technical Design Report

B.J. Mount et al. (The LZ Collaboration), *Preprint, 2017*

[\[paper\]](#)

LUX-ZEPLIN (LZ) conceptual design report

DS Akerib et al. (The LZ Collaboration), *Preprint*, 2015

[\[paper\]](#)

Characterization and Performance of Germanium Detectors with sub-keV Sensitivities for Neutrino and Dark Matter Experiments

A.K. Soma et.al (The Texono Collaboration), *Nuclear Instruments and Methods A* 836, 67-82 (2016)

[\[paper\]](#)

AWARDS & HONORS

Leche Trust Award, The Leche Trust, London UK	2017
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Technology Incubation Scholarship, Ministry of Education, Taipei, Taiwan	2013 - 2016
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CZFF Scholarship, Cengzhong Culture and Education Focus Foundation, NY	2013 - 2014
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Presidential Awards, National Chiao Tung University, Hsinchu, Taiwan	2011 - 2012
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INTERNSHIP

Burberry	London, UK
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<i>Intern / Data science team</i>	Dec 2018
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- Improved digital retail experience for 12M customers through designing and deploying a trending algorithm based on Mann-Whitney U test in production.

TEACHING EXPERIENCE

Tutor in Sub-atomic Physics, St Cathrine's College, University of Oxford	2016 - 2017
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Junior Demonstrator in 1st & 3rd year labs, Department of Physics, University of Oxford	2016 - 2017
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Teaching Assistant in Particle Physics, Department of Physics, University of Oxford	2015 - 2016
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