

# Feng-Ting Liao

MediaTek Research | Taipei, Taiwan

## PERSONAL DATA

Website: [ftliao.github.io](https://ftliao.github.io)

Email: [fengting.liao19@gmail.com](mailto:fengting.liao19@gmail.com)

Tel: +886-972331269

## 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

**Senior Research Scientist**

Nov 2020 - Present

**MediaTek Research**

Taipei, Taiwan

- Co-creator of **Breeze** and **BreeXe**, state-of-art LLMs in Traditional Chinese with >11k total downloads.
  - Actively contributed to key stages of LLM development for Breeze and BreeXe, including data collection, pre-training and post-training processes, evaluation, marketing, and productization.
  - Successfully **productized BreeXe via cloud API and on-premises deployment** to the Traditional Chinese market through aligning diverse stakeholders including internal leadership, legal, marketing, and product and external system integrators and IT departments of corporations within the ecosystem.
  - **Advanced LLM evaluations** through open-sourcing TCEval, the first comprehensive language model benchmark in Traditional Chinese; RAD-Bench, the first benchmark on retrieval augmented dialogues.
  - **Advanced cross-modal application of LLMs** via proposing Generative Fusion Decoding, an algorithmic framework for shallow fusing speech recognition model and LLM without re-training.
- Project lead of **deep reinforcement learning for floor planning in chip design**.
  - Formulated, 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 collaboration to integrate and evaluate AI agents on chip design cases; cross-institutional collaboration 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.

**Research Engineer in Computer Vision**

Mar 2019 - Feb 2020

**Umbo Computer Vision**

Taipei, Taiwan

- Architected a vehicle detection API for real-time surveillance with cross-functional teams; leading a 90% cost reduction and 350% service speed boost for cloud cameras through algorithmic optimization.

Postdoctoral Research Assistant

Jan - Dec 2018

DPhil Researcher

Oct 2013 - Jan 2018

Department of Physics, University of Oxford

Oxford, UK

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

## EDUCATION

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DPhil in Particle Physics, University of Oxford

2013 - 2018

*Supervisor: Professor Hans Kraus*

B.Sc. in Electrophysics, National Chiao Tung University

2008 - 2012

## MENTORSHIP

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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

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**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

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

## INTERNSHIP

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<b>Data Science Intern</b>	Dec 2018
<b>Burberry</b>	London, UK

- Enhanced the digital retail experience for 12M customers during Winter 2018 sales by designing and deploying a trending algorithm using the Mann-Whitney U test.

## TEACHING EXPERIENCE

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