Chen Tao

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Education

Nanyang Technological University (NTU) Aug 2019 – Jun 2023

BEng (Hons) in Electrical and Electronic Engineering (EEE) Singapore

Honours with Highest Distinction

Dean's List (AY2020/21, AY2022/23) (top 5% of class in academic year)

GPA: overall **4.79**/5.00; major **4.91**/5.00

Publication

[1] **Chen Tao**, Jung-jae Kim, "taochen at SemEval-2022 Task 5: Multimodal Multitask Learning and Ensemble Learning", Association for Computational Linguistics (ACL) 2022, International Workshop on Semantic Evaluation.

Manuscript

[1] **Chen Tao**, Li Shen and Soumik Mondal, "Meta-TTT: A Meta-learning Minimax Framework for Test-Time Training", Conference on Computer Vision and Pattern Recognition (CVPR) 2025, under review.

Research Experiences

Agency for Science, Technology, and Research (A*STAR) Aug 2023 – Present

Cyber Security, Research Engineer Prof. Khin Mi Mi Aung

Project 1: Scalable Security-Preserving Computational Analysis

- Investigated patch attacks and defense on compressed vision transformer models.
- Surveyed secure post-training quantization techniques to safeguard model robustness against physical attacks on IoT applications.

Project 2: Private Inference of Language Models with Homomorphic Encryption

- Approximated polynomial circuits for secure language model inference (BERT-Tiny and Mamba) with homomorphic encryption.
- Implemented Message Passing Interface (MPI) with Docker and OpenMPI across multiple servers to minimize inference time.

Project 3: Domain Adaptation for Generalizable Deepfake Detection

- Implemented a minimax meta-learning framework for test-time training that achieved state-of-the-art results on data adaptation benchmarks and was submitted to CVPR 2025.
- Adapted the workflow to detect zero-day deepfake attack.

Project 4: Multimodal Context-aware Automated Fact Checker

- Constructed real-time automatic fact checker comparable to Perplexity and Bing.
- Presented to Ministers at the 2023 Singapore Week of Innovation and TeCHnology and the 2024 Online Trust and Safety Forum in Singapore.

Nanyang Technological University Aug 2022 – May 2023

Undergraduate Final Year Project Prof. Lihui Chen

- Fine-tuned language models with contrastive learning and adapters, enhancing baseline performance by **7%** on the Patent Similarity dataset.
- Distilled knowledge from cross-encoder based models to bi-encoder based counterparts to reduce runtime overheads.

Agency for Science, Technology, and Research (A*STAR) Dec 2021 – May 2022
Machine Intelligence, Research Intern Prof. Jung-Jae Kim

- Won **4th** place for Subtask A and **6th** place for Subtask B among over 400 participants on SemEval-2022 Task 5: Multimedia Automatic Misogyny Identification.
- Developed multitask multi-modal ensemble models to effectively fuse image and textual representations, enhancing baseline performance by **28%**.

NTU Quantum Science and Engineering Center (QSec) Aug 2020 – May 2021
Undergraduate Researcher Prof. Ai Qun Liu

- Improved the efficiency of graph similarity measurement by encoding graph structures into the quantum Hilbert space.
- Simulated Gaussian boson sampling device for fast subgraph matching.

Industrial Experiences

Grab Singapore Headquarters Feb 2022 – May 2022
Software Engineering Intern

- Built keyword extraction models and applied topic modeling techniques to derive key insights from internal audit reports.
- Designed Knime workflows to automate model training and enable model to automatically adapt to new data input.

Singapore Power Group May 2021 – Jul 2021
AI Engineering Intern

- Developed an automated platform to manage technical interview environments, enabling streamlined testing and evaluation of job applicants.
- Deployed service as an AI chatbot with intensive bash scripting and orchestration with Docker containers and Kubernetes.

Languages and Skills

Languages: English (fluent, TOEFL 114/120, GRE 330/340), Mandarin (native).

Programming: Python, C/C++, JavaScript, PHP, SQL (MySQL, NoSQL), Bash, MATLAB.

SWE: Docker, Kubernetes, OpenMPI, OpenFHE, Git, Linux.

ML/DL: PyTorch, TensorFlow, Keras, Hugging Face, Pandas, NumPy, Scikit-Learn, NLTK, SciPy, SpaCy, MMF.

Selected Coursework

ML/AI: Artificial Intelligence & Data Mining (A+), Machine Learning Design & Application, Pattern Recognition & Deep Learning (A+).

CS: Data Structures & Algorithms (A+), Cyber Security, Designing & Developing Databases, Microprocessors (A+), Web Application Design (A).

Math: Calculus (A+), Linear Algebra (A+), Discrete Mathematics (A+), Numerical Methods (A+), Statistics (A+), Mathematics for Visual Data Processing, Probability Theory & Applications (A+), Stochastic Processes, Financial Mathematics (A+).

Other Experiences and Community Involvement

Women in Tech at National University of Singapore, Mentor Feb 2024 – Present
Beyond Taiwan, Mentor & Speaker Oct 2021 – May 2022
NTU EEE Club, Business Director Aug 2022 – Apr 2023
NTU EEE Club, Business Manager Aug 2019 – Apr 2022
Machine Learning and Data Analytics Workshops, Instructor Aug 2021 – May 2022