Tsung-Min (Vincent) Pai

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EDUCATION

Electrical Engineering, National Taiwan University (NTU) Taipei, Taiwan
Bachelor of Science in Engineering *Sep 2021 - Present*

- Last-60-credit GPA: 3.87/4.0
- **Relevant Courses:** *Machine Learning, *Generative Artificial Intelligence, Foundation of Artificial Intelligence, Data Science, Data Visualization, Data Structure, Algorithms, *Decentralized Finance, Wireless and Mobile Networking, Computer Networks, Network and Multimedia, Electronics, Electromagnetics, Power Engineering etc... (* graduate-level)

Bioenvironmental System Engineering, National Taiwan University (NTU) Taipei, Taiwan
Bachelor of Science in Engineering *Sep 2020 - Jun 2021*

- **Dean's List Award**: 2020 Fall (**Top 5%**), Overall Ranking: **1/51** (**Top 1%**)

WORK EXPERIENCE

AI Engineer, LOGOLO New Westminster, Canada
Contractor, Remote *Sep 2025 - Present*

- Developed an **AI grading system** for national legal examinations providing real-time feedback with 95% accuracy.
- Designed a parallelized architecture that accelerated the grading process by 90% over manual methods.

AI Engineer, Genibuilder Taipei, Taiwan
Full Time *Sep 2024 - Aug 2025*

- Engineered a **conversational AI agent** to replace aesthetic clinic consultants, automating the advisory process for real-time response and reducing client operational costs by 80%.
- Utilized a multi-agent architecture with the DSPy concurrent framework, RAG, Database design, and context engineering.
- Designed an AI system realistically **simulating user-product interactions**, reducing manual validation time by over 80%.
- Developed an AI-powered data extraction pipeline to automatically deliver authentic client chat logs for the R&D team.

AI Engineer, Compal Electronics Taipei, Taiwan
Intern *Jul 2024 - Aug 2024*

- Conducted researches about knowledge graph, RAG, LLM agent, LLM fine-tuning for **product improvement**.

PUBLICATIONS & CONFERENCE EXPERIENCE

- **Tsung-Min Pai**, Jui-I Wang, Li-Chun Lu, Shao-Hua Sun, Hung-Yi Lee, Kai-Wei Chang, "BILLY: Steering Large Language Models via Merging Persona Vectors for Creative Generation", Under Review of ARR
- Chien-yu Huang, ..., **Tsung-Min Pai**, ..., Hung-Yi Lee, "Dynamic-SUPERB Phase-2: An Open Benchmark Evolving through Collaborative Expansion for Comprehensive Evaluation of Spoken Language Models with 180+ Tasks", **ICLR 2025. Citation 41.**
- Li-Chun Lu*, Shou-Jen Chen*, **Tsung-Min Pai**, Chan-Hung Yu, Hung-Yi Lee, Shao-Hua Sun, "LLM Discussion: Enhancing the Creativity of Large Language Models via Discussion Framework and Role-Play", **COLM 2024. Citation 63.**
- **Reviewer** of International World Wide Web Conference (**WWW**) **2025**

RESEARCH EXPERIENCE

Speech Processing and Machine Learning Laboratory (SPMLLab), NTU Taipei, Taiwan
Undergraduate Researcher | Advisor: ***Prof. Hung-yi Lee*** *Aug 2023 - Present*

- Introduced BILLY, merging persona vectors of LLMs to enhance the creativity and **replace discussion of multi-LLM systems in smaller LLMs**. Boosting Originality by 15% and reducing the cost by 95% than multi-LLM baseline. (Co-advised by ***Prof. Shao-Hua Sun***)
- Contributed the ***Covid19CoughAudioClassification*** task to the Dynamic-SUPERB benchmark by devising and preprocessing a novel dataset for evaluating universal speech models.

Robot Learning Laboratory (RLLab), NTU Taipei, Taiwan
Undergraduate Researcher | Advisor: ***Prof. Shao-Hua Sun*** *Nov 2023 - Oct 2024*

- Developed a **multi-agent discussion framework** utilizing role-play that boosted LLM creativity scores by 20% over existing methods. (Co-advised by ***Prof. Hung-yi Lee***)
- Designed an **LLM creativity evaluation benchmark and metrics** with 0.7 human-level correlation, validated on over 1,400 text generations.

Advanced Internet Technologies and Services Laboratory, IIS, Academia Sinica Taipei, Taiwan
Research Intern | Principal Investigator: ***Dr. Meng-Chang Chen*** *Jul 2023 - Mar 2024*

- Trained GraphSAGE, GCN, and GAT models to **detect malicious behaviors** in Windows system log with about 83% recall.
- Trained the Trans Family and SecureBERT models to generate the embedding of the knowledge graph for classification.

Wireless and Mobile Networking Laboratory (WMNLab), NTU Taipei, Taiwan
Undergraduate Researcher | Advisor: ***Prof. Hung-Yu Wei*** *Feb 2023 - Nov 2023*

- Utilized RNN, CatBoost, and XGBoost for the prediction and classification of **mobile device handovers**.
- Providing the core dataset for classification models of handovers through live UDP protocol experiments on the MRT.

PROJECTS

EltAI Engine Taipei, Taiwan
Project Leader *Oct 2024*

- Engineered an LLM agent for ELTA TV, powered by **multi-modal RAG** to deliver real-time sports game analysis, multilingual interaction, and result prediction capabilities for enhanced user experience.
- Achieved a spot in the **Top 10 out of 836** teams and won the Corporate Challenge Award in GenAI Stars 2024 hackathon.

Texas Hold'em AI Taipei, Taiwan
Self Project *May 2024*

- Engineered a Texas Hold'em AI using a multi-threaded C++ engine to calculate precise, **real-time win probabilities** through exhaustive enumeration post-flop.
- Conducted comparative analyses of paradigms including **Monte Carlo simulation, Q-learning, DQN, and MCCFR**.

Exchange Student Matching Platform Taipei, Taiwan
Project Leader *May 2024*

- Developed a comprehensive **exchange student matching platform**, integrating robust user authentication, profile management, and multi-conditional filtering capabilities.
- Implemented a **matching algorithm with KNN** for personalized recommendations and mutual friend connections.

TEACHING EXPERIENCE

Introduction to Generative AI, NTU (Course Webpage) Taipei, Taiwan
Teaching Assistant (TA) *Sep 2024 - Aug 2025*

- Collaborated with 30+ TAs to manage a class of over 1,000 students and 1,000 auditors.
- Designed and graded a coursework related to token importance and LLM interpretation with two other TAs.
- Contributed to a published paper in **EMNLP 2024**

EXTRACURRICULAR ACTIVITIES

GenAI Stars 2024 Hackathon, High Distinction Award (Top 10 of 836 Teams) Taipei, Taiwan
Team Leader *Oct 2024*

Department Basketball Team, NTU Electrical Engineering Taipei, Taiwan
Vice Captain / Coach / Team Member *Sep 2021 - Aug 2025*

School Basketball Team, NTU Taipei, Taiwan
Team Member *Sep 2020 - Aug 2021*

SKILLS

Spoken Languages: Chinese (Native), English (Fluent, TOEFL: R:27 / L:24 / S:24 / W:26)

Programming Languages: Python, C++, Golang, HTML / CSS, Matlab, JavaScript, Verilog

Miscellaneous: Pytorch, Scikit-Learn, LangChain, LlamaIndex, GCP, CICD, Git, n8n, MongoDB, Redis, PSpice