



## Pei-Fu (Fred) Guo

I am a second-year M.S. student in Computer Science at NTU, advised by Prof. Shou-De Lin. My research focuses on Natural Language Processing, particularly LLM uncertainty estimation, benchmarking, and domain-specific applications. I expect to graduate in January 2026 and am currently applying for Ph.D. opportunities to start in Fall 2026.

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## EDUCATION

- **National Taiwan University (NTU)** 2024/3 - Present  
*M.S. in Computer Science & Information Engineering (GPA : 3.98/4.3)*  
 – Member of MSLab (Advised by Prof. Shou-De Lin)
- **National Taiwan University (NTU)** 2019/9 - 2023/12  
*B.S. in Economics (GPA : 3.92/4.3)*

## PUBLICATIONS (78 CITATIONS BY Nov 2025).

- [1] **Pei-Fu Guo**, Yun-Da Tsai, Chun-Chia Hsu, Kai-Xin Chen, Ya-An Tsai, Kai-Wei Chang, Nanyun Peng, Mi-Yen Yeh, and Shou-De Lin. LiveCLKTBench: Towards Reliable Evaluation of Cross-Lingual Knowledge Transfer in Multilingual LLMs. *Under review at ACL ARR October 2025*.
- [2] **Pei-Fu Guo**, Yun-Da Tsai, and Shou-De Lin. Why is the LLM unsure? Profiling the Causes of LLM Uncertainty for Adaptive Model and Uncertainty Metric Selection. *Under review at ICLR 2026*. [\[PDF\]](#)
- [3] **Pei-Fu Guo**, Yun-Da Tsai, and Shou-De Lin. Benchmarking Uncertainty Metrics for LLM Target-Aware Search. *EMNLP 2025 Findings*. [\[PDF\]](#)
- [4] Yun-Da Tsai\*, Ting-Yu Yen\*, **Pei-Fu Guo**, and Shou-De Lin. Text-centric Alignment for Bridging Test-time Unseen Modality. *EMNLP 2025 Findings*. [\[PDF\]](#)
- [5] **Pei-Fu Guo\***, Ying-Hsuan Chen\*, Yun-Da Tsai, and Shou-De Lin. Towards Optimizing with Large Language Models. *KDD 2024 Knowledge-Infused Learning Workshop*. [\[PDF\]](#) (57 citations)

## RESEARCH PROJECTS

- **Towards Reliable Evaluation of Cross-Lingual Knowledge Transfer in LLMs.** LLM Evaluation 2025/3-2026/3  
*Graduate Research, MSLab & UCLA-NLP (Advisors: Kai-Wei Chang, Nanyun Peng, Mi-Yen Yeh, Shou-De Lin)*  
 – Existing cross-lingual transfer benchmarks often suffer from data leakage, leading to unreliable evaluation.  
 – Proposed a new benchmark that measures genuine cross-lingual knowledge transfer by curating LLM-unseen knowledge, ensuring contamination-free testing.
- **Profiling LLM Uncertainty for Adaptive Model & Metric Selection.** LLM Uncertainty 2025/2-2026/2  
*Graduate Research, MSLab (Advisor: Shou-De Lin)*  
 – Existing uncertainty estimators capture total response uncertainty but provide limited guidance for improvement.  
 – Decomposed LLM uncertainty into multiple interpretable sources and analyzed metrics/models across diverse tasks to identify optimal model-metric combinations.
- **AI-Trading Agent** Applied ML/DL 2024/7-2025/2  
*Graduate Research, MSLab & UC Capital (Advisor: Shou-De Lin)*  
 – Traditional trading strategies often rely on limited signals and fixed rules, constraining decision quality.  
 – Developed models with distinct objectives to provide data-driven decision support for traders.
- **Benchmarking Uncertainty Metrics for LLM Target-Aware Search** LLM Uncertainty 2024/3-2025/3  
*Graduate Research, MSLab (Advisor: Shou-De Lin)*  
 – Current LLM search algorithms often rely on statistical uncertainty measures (e.g., UCB) to guide search. However, LLM-derived uncertainty metrics may encode richer task-relevant information.  
 – Proposed a benchmarking framework to evaluate how well LLM-derived uncertainty metrics can guide search towards task-specific objectives.
- **Text-centric Alignment for Bridging Test-time Unseen Modality.** LLM Applications 2023/9-2024/5  
*Undergraduate Research, MSLab (Advisor: Shou-De Lin)*  
 – Addressed modality mismatch problem in multimodal learning.  
 – Leveraged the pretrained knowledge and reasoning ability of LLMs to align multimodal representations into a unified text-centric space, enabling effective zero-shot prediction.
- **Towards Optimizing with Large Language Models** LLM Evaluation 2023/3-2023/10  
*Undergraduate Research, MSLab (Advisor: Shou-De Lin)*  
 – Despite strong mathematical reasoning, LLMs' potential as search optimizers remains underexplored.  
 – Designed mathematical/combinatorial optimization tasks with evaluation metrics to analyze LLM performance.

## Work Experience

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- **APPIER – LLM Research Scientist Intern** LLM Applications 2024/7 – 2025/3  
*AI SaaS company specializing in AI-driven marketing and sales automation solutions. Taipei, Taiwan*
  - Developed AI Sales-Bot, an LLM-based agent that integrates retrieval, dialogue management, and recommendation modules for personalized user interaction in online shopping.
  - Implemented context-aware intent detection using multi-turn dialogue history and user behavior signals.
  - Constructed large-scale product knowledge graph capturing relationships among thousands of items to provide structured domain context for LLM reasoning in e-commerce settings.
  - Designed an internal evaluation framework to benchmark the agent's performance in recommendation accuracy and intent understanding across dialogue scenarios.

## Competitions

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- **TSMC IT CareerHack: Digital Transform x Generative AI** LLM Applications 2024/1  
*Finalist (Top 6 teams selected)*
  - Competition topic: Factory domain knowledge chatbot implementation.
  - Developed a retrieval-augmented generation (RAG) system with adaptive LLM caching and dynamic model switching to reduce inference cost and support multimodal input.
- **Ministry of Interior Hackathon: Data Innovation Application Competition** Applied ML/DL 2023/7  
*Finalist (Top 8 teams selected)*
  - Applied machine learning and statistical analysis to derive indicators for pedestrian road safety in Taipei City.
  - Developed a web-based visualization platform presenting city-wide safety maps and analytics results.

## Academic Services

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Reviewers: ACL ARR 2025, ACML 2024