



Dr. Tao Fang

Department of Digital and Intelligent Language Services

Assistant Professor | Master's Supervisor

Biography

I have long been dedicated to cutting-edge interdisciplinary fields including mathematics and computational mathematics, artificial intelligence, natural language processing and multimodal learning, large language models, as well as explainable large-scale models for healthcare, finance, and agriculture. This work has enabled me to establish a systematic research trajectory that spans from fundamental mathematics to intelligent computing. Prior to 2020, my research focused primarily on the intersection of mathematics and AI, with an emphasis on integrating numerical solutions to partial differential equations with machine learning methods. This period laid a solid foundation in mathematical theory and scientific computing. From 2020 to 2024, I pursued my Ph.D. at the Natural Language Processing & Portuguese-Chinese Machine Translation Laboratory at the University of Macau, where I systematically studied natural language processing. My work covered core tasks such as machine translation, grammatical error correction, and dialogue summarization, while also delving deeply into pre-trained language models and multimodal learning mechanisms. Currently, as an Assistant Professor at the Macau Millennium College, I continue to conduct cutting-edge research centered on intelligent language services, natural language processing, large language models, and their real-world applications.

In terms of academic output, I have authored or co-authored over 20 papers as first author, corresponding author, or co-author. Some of this work has been published in top-tier NLP conferences such as ACL (CCF-A), the flagship speech signal processing conference ICASSP (CCF-B), the International Joint Conference on Neural Networks IJCNN (CCF-C), as well as leading SCI journals including ESWA and TASLP. I also serve as a long-standing reviewer for premier AI conferences and journals, including AAAI, ICLR, ICML, ACL, EMNLP, TACL, TASLP, ESWA, Neural Networks, ICASSP, and IJCNN.

Additionally, I have led and participated in multiple projects funded by the National Natural Science Foundation of China, the Science and Technology Development Fund of Macau (FDCT), and industry-university collaborations.

Education Background

- Ph.D. in Computer Science, University of Macau, Faculty of Science and Technology, 2020–2024

Research Interests

- Machine Learning and Deep Learning,
- Natural Language Processing (NLP),
- Large Language Models (LLMs), Vision-Language Models (VLMs),
- and Reasoning Models.

Teaching Courses

- Python and Large Language Models,
- Machine Translation

Social Service

Reviewer for top-tier AI conferences and journals, including AAAI, ICLR, ICML, ACL, EMNLP, ICASSP, IJCNN, TACL, TASLP, and Neural Networks.

Research Outputs

JOURNAL PAPERS

[1]. Tao Fang, Tianyu Zhang, Derek F. Wong, Keyan Jin, Lusheng Zhang, Qiang Zhang, Tianjiao Li, Jinlong Hou, Lidia S. Chao. LLMCL-GEC: Advancing Grammatical Error Correction with LLM-Driven Curriculum Learning. Expert Systems with Applications (ESWA). 2025. Volume 279, 127397. (SCI-Q1 / JCR-Q1, TOP Journal, First Author).

[2]. Keyan Jin, Yapeng Wang, Leonel Santos, Tao Fang, Xu Yang, Sio Kei Im, Hugo Gonalo Oliveira. Reasoning or Not? A Comprehensive Evaluation of Reasoning LLMs for Dialogue Summarization. Expert Systems with Applications (ESWA). 2025. Volume 299, 129831. (SCI-Q1 / JCR-Q1, TOP Journal).

[3]. Run-Fa Zhang, Ming-Chu Li, Tao Fang, Fu-Chang Zheng, Sudao Bilige. Multiple exact solutions for the dimensionally reduced p-gBKP equation via bilinear neural network method. Modern Physics Letters B. 2022. Vol. 36, No. 06, 2150950. (SCI; JCR: Q1).

[4]. Tao Fang, Yun-Hu Wang. Lump-stripe interaction solutions to the potential Yu–Toda–Sasa–Fukuyama equation. Analysis and Mathematical Physics. 2019. Volume 9, Issue 3, pp 1481–1495. (SCI; JCR: Q1, First Author).

[5]. Tao Fang, Hui Wang, Yun-Hu Wang, Wen-Xiu Ma. High-Order Lump-Type Solutions and Their Interaction Solutions to a (3+1)-Dimensional Nonlinear Evolution Equation.

Communications in Theoretical Physics. 2019. Vol.71 No.8 pages: 927-934. (SCI; JCR: Q1, First Author).

[6]. Runfa Zhang, Sudao Bilige, Tao Fang, Temuer Chaolu. New periodic wave, cross-kink wave and the interaction phenomenon for the Jimbo–Miwa-like equation. Computers & Mathematics with Applications. 2019. Volume 78, Issue 3, Pages 754-764. (SCI; JCR: Q1).

[7]. Tao Fang, Chun-Na Gao, Hui Wang, Yun-Hu Wang. Lump-type solution, rogue wave, fusion and fission phenomena for the (2+1)-dimensional Caudrey–Dodd–Gibbon–Kotera–Sawada equation. Modern Physics Letters B. 2019. Vol. 33, No. 18, 1950198. (SCI; JCR: Q1, First Author).

[8]. Tao Fang, Yun-Hu Wang. Interaction solutions for a dimensionally reduced Hirota bilinear equation. Computers & Mathematics with Applications. 2018. Volume 76, Issue 6, Pages 1476-1485. (SCI; JCR: Q1, First Author).

CONFERENCE PAPERS

[1]. Wentao Zhang, Tao Fang*, Lina Lu, Lifei Wang, Weihe Zhong. CPJ: Explainable Agricultural Pest Diagnosis via Caption-Prompt-Judge with LLM-Judged Refinement . ICASSP 2026 - 2026 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2026, pp. 5156-5160 ([CCF-B], Corresponding Author).

[2]. Jiarui Lu, Tao Fang*, Shuo Huang, Yongxiu Xu, Yubin Wang, Gaopeng Gou, Haoliang Zhang, Hongbo Xu. DREAM: DUAL-PERSPECTIVE REASONING AND ATTRIBUTION-BASED REFINEMENT FOR CONVERSATIONAL QUERY REWRITING. ICASSP 2026 - 2026 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2026, pp. 18122-18126. ([CCF-B], Corresponding Author).

- [3]. Hongxi Mao, Wei Zhou, Mengting Jia, Tao Fang, Huan Gao, Bin Zhang, Shangyang Li. Schema-Adaptive Tabular Representation Learning with LLMs for Generalizable Multimodal Clinical Reasoning. (Accepted by 2026 ACL Conference [CCF-A])
- [4]. Wentao Zhang, Lifei Wang, Lina Lu, Mingkun Xu, Shangyang Li, Yanchao Yang, Tao Fang*. Agri-R1: Agricultural Reasoning for Disease Diagnosis via Automated-Synthesis and Reinforcement Learning. arXiv:2601.04672 (arXiv Preprint, Corresponding Author).
- [5]. Keyan Jin, Yapeng Wang, Tao Fang, Leonel Santos, Xu Yang, Sio Kei Im. SSCM: Self-Supervised Critical Model for Reducing Hallucinations in Chinese Financial Text Generation. ICASSP 2025: 2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). 2025. Pages 1-5. (CCF-B, Top Conference on Intelligent Speech and Signal Processing).
- [6]. Keyan Jin, Yapeng Wang, Leonel Santos, Tao Fang, Xu Yang, Sio Kei Im. DABART: Dynamic Semantic Optimization Framework for Dialogue Summarization via Adaptive Topic Analysis and Semantic Bridging. International Joint Conference on Neural Networks (IJCNN). 2025 (Oral, CCF-C, Top Conference on Neural Networks).
- [7]. Kaixin Lan, Tao Fang, Derek F. Wong, Yabo Zu, Lidia S. Chao, Cecilia Guanfang Zhao. FOCUS: Forging Originality through Contrastive Use in Self-Plagiarism for Language Models. ACL 2024 (Long Paper), Bangkok, Thailand. Association for Computational Linguistics (ACL). 2024. Pages 14432–14447. (CCF-A, Top Conference on Natural Language Processing, Co-first Authors).
- [8]. Tao Fang, Xuebo Liu, Derek F. Wong, Runzhe Zhan, Liang Ding, Lidia S. Chao, Dacheng Tao, and Min Zhang. TransGEC: Improving Grammatical Error Correction with Translationese. ACL 2023 (Long Paper), Toronto, Canada. Association for Computational Linguistics (ACL). 2023. Pages 3614–3633. (CCF-A, Top Conference on Natural Language Processing, First Author).

- [9]. Tao Fang, Jinpeng Hu, Derek F. Wong, Xiang Wan, Lidia S. Chao, and Tsung-Hui Chang. Improving Grammatical Error Correction with Multimodal Feature Integration. ACL 2023 (Long Paper), Toronto, Canada. Association for Computational Linguistics (ACL). 2023. Pages 9328–9344. (CCF-A, Top Conference on Natural Language Processing, First Author).
- [10]. Tao Fang, Shu Yang, Kaixin Lan, Derek F. Wong, Jinpeng Hu, Lidia S. Chao, Yue Zhang. Is ChatGPT a Highly Fluent Grammatical Error Correction System? A Comprehensive Evaluation. 2023. arXiv:2304.01746. (arXiv Preprint, Citations: 173, First Author).
- [11]. Yue Zhang, Leyang Cui, Deng Cai, Xinting Huang, Tao Fang, Wei Bi. Multi-Task Instruction Tuning of LLaMa for Specific Scenarios: A Preliminary Study on Writing Assistance. 2023. arXiv:2305.13225. (arXiv Preprint).

PATENT

- [1]. Ding Qiao, Ding Heng, Wang Jian, Fang Tao, Dong Shiyu, Zhu Enchang. A News Classification Method for Domain Pre-training Based on Adaptive Selective Masking. (2024.11). Patent No.: 202411597329.0 (Invention Patent, Filed)
- [2]. Jin Keyan, Fang Tao, Zhang Yiyun. An Intelligent Recommendation Method Based on Scholars' Academic Backgrounds and User Tags. (2025.01). Patent No.: 2025100540722 (Invention Patent, Filed)

RESEARCH PROJECT

- [1]. Demonstration Application of an Emergency Speech Translation System (Chinese-English-Portuguese) Based on Edge-Side Large Language Models in the Guangdong-Hong Kong-Macao Greater Bay Area; Industry-Sponsored Project; 2026.04–2028.04; Project Lead / Principal Investigator.

[2]. Technical Pathways and Application Research on Intelligent Translation of Patient Symptoms in Chinese, English, Portuguese, and Cantonese in Macao; China International Communications Development Research Project, China Foreign Languages Publishing Administration; 2025.07–2026.02; Core Project Member / Key Participant.

[3]. Research on Chinese-Oriented Low-Resource Machine Translation Technologies; NSFC-FDCT; FDCT/060/2022/AFJ; 2023/01–2025/12; Core Project Member.

[4]. Modularized Semantic Neural Machine Translation: Fundamentals & Application; MOST-FDCT; FDCT/070/2022/AMJ; 2022/12–2025/12; Core Project Member.

[5]. Pretraining-based Automatic Evaluation of Machine Translation; MYRG; MYRG-GRG2023-00006-FST-UMDF; 2024/01–2025/12; Core Project Member.

[6]. Research of Non-Autoregressive Neural Machine Translation; MYRG; MYRG2020-00054-FST; 2021/01–2023/12; Core Project Member.

[7]. Guiding Self-Attention Based Neural Machine Translation with Linguistic Prior Knowledge; FDCT; 0101/2019/A2; 2019/09–2022/08; Core Project Member.