QIWEI MA

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EDUCATION

Shenzhen Univeristy (SZU) *May 2026 (expected)*
M.S. in Artificial Intelligence
GPA: 3.5/4.0

Ningxia Univeristy (NXU) *June 2022*
B.E. in Materials
GPA: 3.0/4.0

RESEARCH INTERESTS

I am interested in Large Language Models (LLMs), multi-agent systems, and their applications, with particular emphasis on education. I am also concerned with the security and privacy issues arising from the deployment of these AI technologies in educational settings.

RESEARCH EXPERIENCE

Multi-Agent Conversational AI for EFL Speaking Practice [1] Jan 2025 - Oct 2025
Supervisors: Dr. Zhang SZU

- Proposed a multi-agent system (MAS) for EFL speaking practice.
- Completed development of seven specialized agents (preprocessing, response generation, dialogue supervision).
- Explored mechanisms of MAS superiority, confirming synergistic effects of integrated features.
- Found MAS outperforms single-agent system(SAS) in oral proficiency gains (p=0.049) and grammatical accuracy (p=0.016) via a 4-week controlled experiment with 32 university EFL learners.
- Explored mechanisms of MAS superiority, confirming synergistic effects of integrated features: 26% more practice sessions, 15% longer utterances, and 70% reduction in repeated grammatical errors.

Reasoning for Table Manipulation Mar 2025 - Present
Supervisors: Dr. Yang, Dr. Tan Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

- Proposed an end-to-end LLM to manipulate tabular structures via structured reasoning.
- Constructed a benchmark covering 5 core tasks: table splitting/merging, wide-to-long conversion, semi-structured field parsing, and row/column generation.
- Completed two-stage training (SFT on reasoning traces + GRPO optimization), achieving state-of-the-art performance among 7B-scale table-specific models.
- Explored structural integrity challenges in table manipulation, identifying that column-level accuracy outperforms row-level accuracy across models due to sensitivity to missing fields.

OTHERS

Differential Privacy Image Generation Mar 2024 - Apr 2025
Supervisors: Dr. Zhang SZU

- Proposed a novel differential privacy framework for image generation using Error Feedback SGD to eliminate gradient clipping bias and improve training stability.
- Introduced reconstruction loss and noise injection during generator upsampling stages to enhance data utility and image diversity.

- Designed multi-component training pipeline integrating generator, discriminators, classifier, and encoder with gradient sanitization mechanisms.
- Achieved state-of-the-art performance on MNIST and Fashion-MNIST, surpassing baseline methods in Inception Score, Frechet Inception Distance, and downstream classification accuracy.

Intelligent Annotation and Feedback System for English Writing Apr 2025 - Present
Supervisors: Dr. Zhang SZU

- Developed LLM-IAF (LLM-based Intelligent Annotation & Feedback System), a mobile application for automated English writing evaluation targeting junior high school students.
- Implemented dual-engine AI workflow combining semantic evaluation and visual grounding to provide immediate, visualized feedback with error localization on handwritten essays.
- Conducted quasi-experimental study with 100 grade-8 students, comparing experimental group using LLM-IAF versus control group with traditional instruction over four weekly writing tasks.
- Achieved significant improvement in writing performance for experimental group compared to control group, with substantial gains in learning engagement and writing self-efficacy.
- Demonstrated strong AI-teacher score correlation and good agreement; students reported high satisfaction with system's usefulness and ease of use.

PUBLICATIONS

[1] J. Zhang, **Qiwei Ma**, Y. Zhang, and X. Cao, "Multi-agent vs. single-agent ai for efl speaking practice: A controlled experiment with hybrid input, contextual dialogue, and proficiency-adaptive feedback," in Educational Technology & Society (ET&S), 2025, (Accepted).