Zhiwei He (何志威)

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Research Interest

I am a fourth-year Ph.D. candidate at Shanghai Jiao Tong University's Department of Computer Science and Engineering. I am dedicated to **pushing the boundaries of machine intelligence**.

My recent work focuses on **long and efficient reasoning models**:

- **Scaling Test-Time Compute:** Enhancing models' problem-solving power by developing challenging training data [1] for reinforcement learning with verifiable rewards (RLVR) and exploring multi-agent collaboration frameworks [2].
- **Optimizing Reasoning Efficiency:** Identifying and mitigating common pitfalls in reasoning models, such as "over-thinking" [3] and "under-thinking" [4], to achieve an optimal balance between performance and computational cost.
- **Boosting Training Efficiency:** Designing novel parameter-efficient fine-tuning (PEFT) methods [5] for training powerful models with constrained resources.

I also possess expertise in **multilingual NLP** [7-11].

Education

2021 – present ◇ **PhD, Shanghai Jiao Tong University** Computer Science.
Supervisor: Rui Wang

2017 – 2021 ◇ **BSc, South China University of Technology** Software Engineering.
Ranking: 1/252 | GPA: 3.91

Internship

2021 – present ◇ **Tencent AI Lab** Research Intern
Mentors: Yan Wang & Zhaopeng Tu

Selected Publications

*: Equal Contribution

[1] **DeepMath-103K: A Large-Scale, Challenging, Decontaminated, and Verifiable Mathematical Dataset for Advancing Reasoning**.
Zhiwei He, Tian Liang, Jiahao Xu, Qiuzhi Liu, Xingyu Chen, Yue Wang, Linfeng Song, Dian Yu, Zhenwen Liang, Wenxuan Wang, Zhuosheng Zhang, Rui Wang, Zhaopeng Tu, Haitao Mi, Dong Yu
arXiv 2025. **Top-1 dataset @ HF with 40K+ downloads, Github Stars: 220+**

[2] **Encouraging Divergent Thinking in Large Language Models through Multi-Agent Debate**.
Tian Liang*, **Zhiwei He***, Wenxiang Jiao*, Xing Wang, Yan Wang, Rui Wang, Yujiu Yang, Zhaopeng Tu, Shuming Shi
EMNLP 2024. **Pioneer of Multi-Agent LLM, Citations: 520+, Github Stars: 400+**

[3] **Do NOT Think That Much for 2+3=? On the Overthinking of o1-Like LLMs**.
Xingyu Chen*, Jiahao Xu*, Tian Liang*, **Zhiwei He***, Jianhui Pang, Dian Yu, Linfeng Song, Qiuzhi Liu, Mengfei Zhou, Zhuosheng Zhang, Rui Wang, Zhaopeng Tu, Haitao Mi, Dong Yu
ICML 2025. **Citations: 170+, Adopted by Kimi-1.5**

[4] **Thoughts Are All Over the Place: On the Underthinking of o1-Like LLMs**.
Yue Wang*, Qiuzhi Liu*, Jiahao Xu*, Tian Liang*, Xingyu Chen*, **Zhiwei He***, Linfeng Song, Dian Yu, Juntao Li, Zhuosheng Zhang, Rui Wang, Zhaopeng Tu, Haitao Mi, Dong Yu
arXiv 2025. **Citations: 50+**

[5] **RaSA: Rank-Sharing Low-Rank Adaptation**.
Zhiwei He, Zhaopeng Tu, Xing Wang, Xingyu Chen, Zhijie Wang, Jiahao Xu, Tian Liang, Wenxiang Jiao, Zhuosheng Zhang, Rui Wang
ICLR 2025.

[6] **R-Judge: Benchmarking Safety Risk Awareness for LLM Agents**.
Tongxin Yuan*, **Zhiwei He***, Lingzhong Dong, Yiming Wang, Ruijie Zhao, Tian Xia, Lizhen Xu, Binglin Zhou, Fangqi Li, Zhuosheng Zhang, Rui Wang, Gongshen Liu
EMNLP 2024 *(Findings)*. **Citations: 100+**

[7] **Can Watermarks Survive Translation? On the Cross-lingual Consistency of Text Watermark for Large Language Models**.
Zhiwei He, Binglin Zhou, Hongkun Hao, Aiwei Liu, Xing Wang, Zhaopeng Tu, Zhuosheng Zhang, Rui Wang
ACL 2024. **Oral (2.3%), Best Paper Recommendation**
Integrated in *Dive into LLMs @ SJTU* (Github Stars: 6.9K) and *MarkLLM @ THU* (Github Stars: 450+)

[8] **Exploring Human-Like Translation Strategy with Large Language Models**.
Zhiwei He, Tian Liang, Wenxiang Jiao, Zhuosheng Zhang, Yujiu Yang, Rui Wang, Zhaopeng Tu, Shuming Shi, Xing Wang
TACL 2023. **Citations: 130+, Github Stars: 140+**

[9] **Tencent AI Lab-Shanghai Jiao Tong University Low-Resource Translation System for the WMT22 Translation Task**.
Zhiwei He, Xing Wang, Zhaopeng Tu, Shuming Shi, Rui Wang
WMT 2022. **Winner of English-to-Livonian**

[10] **Improving Machine Translation with Human Feedback: An Exploration of Quality Estimation as a Reward Model**.
Zhiwei He, Xing Wang, Wenxiang Jiao, Zhuosheng Zhang, Rui Wang, Shuming Shi, Zhaopeng Tu
NAACL 2024. **Best Paper Recommendation**

[11] **Bridging the Data Gap between Training and Inference for Unsupervised Neural Machine Translation**.
Zhiwei He, Xing Wang, Rui Wang, Shuming Shi, Zhaopeng Tu
ACL 2022.

Awards & Competitions

2025 ◇ Tencent Rhino-Bird Elite Talent Program (腾讯犀牛鸟精英人才计划)
2024 ◇ Huatai Securities Science & Technology Scholarship (华泰证券科技奖学金)
2022 ◇ 1st place in the WMT22 General Translation Task, English to Livonian.
2019 ◇ First Class Scholarship for Undergraduate.
2018 ◇ First Class Scholarship for Undergraduate.

Academic Service

Reviewer ◇ ICLR, NeurIPS, ICML, ARR