

# Zhiwei He (何志威)

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🏠 <https://zwhe99.github.io/>

## 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

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- 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

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- Reviewer     ◇   ICLR, NeurIPS, ICML, ARR