Di Zhang

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EDUCATION

School of Computer Science and Technology, Fudan University 09/2023-Present
Ph.D. Student in *Computer Science and Technology* Supervisor: *Prof. Wanli Ouyang*

School of Computer Science and Technology, University of Science and Technology of China. 09/2019-06/2022
M.E. in Computer Technology Supervisor: *Prof. Bei Hua and Prof. Xiaopin Chen*
Dissertation: *Design and Implementation of Safety and Robustness of Mobile Service Robot Navigation in Complex Pedestrian Scenarios*

Department of Architecture and Civil Engineering, Hefei University of Technology. 09/2015-06/2019
B.E. in Water Supply and Drainage Science and Engineering

PUBLICATIONS

- ✓ **Zhang, Di**, Wei Liu, Qian Tan, Jingdan Chen, Hang Yan, Yuliang Yan, Jiatong Li et al. "Chemllm: A chemical large language model." arXiv preprint arXiv:2402.06852 (2024).
- ✓ **Zhang, Di**, Xiaoshui Huang, Dongzhan Zhou, Yuqiang Li, and Wanli Ouyang. "Accessing gpt-4 level mathematical olympiad solutions via monte carlo tree self-refine with llama-3 8b." *arXiv preprint arXiv:2406.07394* (2024).
- ✓ **Zhang, Di**, Jianbo Wu, Jingdi Lei, Tong Che, Jiatong Li, Tong Xie, Xiaoshui Huang, et al. "Llama-Berry: Pairwise Optimization for O1-like Olympiad-Level Mathematical Reasoning." In *2025 Annual Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL2025)*, 2024.
- ✓ **Zhang, Di**, Jingdi Lei, Junxian Li, Xunzhi Wang, Yujie Liu, Zonglin Yang, Jiatong Li, et al. "Critic-v: Vlm Critics Help Catch Vlm Errors in Multimodal Reasoning." In *The Ieee/Cvf Conference on Computer Vision and Pattern Recognition 2025 (CVPR2025)*, 2024.
- ✓ **Zhang, Di**, Weida Wang, Junxian Li, Xunzhi Wang, Jiatong Li, Jianbo Wu, Jingdi Lei et al. "Control-R: Towards controllable test-time scaling." *arXiv preprint arXiv:2506.00189* (2025).
- ✓ **Zhang, Di**, Junxian Li, Shihao Wang, Weida Wang, Guo Chen, Hao Zhang, Shizhe Diao, Mingjie Liu, Ximing Lu, Jaehun Jung, Jian Hu, Karan Sapra, Wanli Ouyang, Andrew Tao, Yejin Choi, Jan Kautz, Guilin Liu, Yi Dong, and Zhiding Yu. 2024. "TinyEye: Sharpening Visual Reasoning of Tiny Models with Offline Policy Optimization. " (Submitted to ICLR2026)
- ✓ Li, Junxian, **Di Zhang**, Xunzhi Wang, Zeying Hao, Jingdi Lei, Qian Tan, Cai Zhou, et al. "Chemvlm: Exploring the Power of Multimodal Large Language Models in Chemistry Area." In *The 39th Annual AAAI Conference on Artificial Intelligence (AAAI2025)*, 2024.
- ✓ Lei, Jingdi, **Di Zhang**, and Soujanya Poria. "Error-Free Linear Attention is a Free Lunch: Exact Solution from Continuous-Time Dynamics." *arXiv preprint arXiv:2512.12602* (2025).
- ✓ Wei, Jiaqi, Hao Zhou, Xiang Zhang, **Di Zhang**, Zijie Qiu, Noah Wei, Jinzhe Li, Wanli Ouyang, and Siqi Sun. "Retrieval is Not Enough: Enhancing RAG through Test-Time Critique and Optimization." In The Thirty-ninth Annual Conference on Neural Information Processing Systems.
- ✓ He, Haonan, Yuchen Ren, Yining Tang, Ziyang Xu, Junxian Li, Minghao Yang, **Di Zhang** et al. "Biology Instructions: A Dataset and Benchmark for Multi-Omics Sequence Understanding Capability of Large Language Models." *arXiv preprint arXiv:2412.19191* (2024).
- ✓ NVIDIA. "Scaling up rl: Unlocking diverse reasoning in llms via prolonged training." *arXiv preprint arXiv:2507.12507* (2025).
- ✓ NVIDIA. "Nvidia nemotron nano v2 vl." *arXiv preprint arXiv:2511.03929* (2025).

(…More on Google Scholar)

ACTIVITIES & AWARDS

- Campus Algorithm Invitational Competition for Big Data in Smart Cities (First Place). 12/2019
- Awarded the second-class academic scholarship (Three times, USTC). 2019-2022
- Awarded the second-class academic scholarship (Three times, FDU). 2023-2025

FULLTIME CARRER EXPERIENCES

Recommendation System Algorithm Engineer at Alibaba Inc. 01/2023-08/2023

- **Acted as a primary algorithm designer** for the LLM-based product listing assistant at Xianyu (Idle Fish), China's largest C2C second-hand marketplace. This innovation automated product descriptions and title optimization, significantly lowering the entry barrier for sellers and improving listing quality and matching efficiency.
- **Led the enhancement of RAG-driven search**, enabling buyers with different price preferences to find the most suitable products faster. This not only streamlined the listing process but also boosted transaction match rates across the marketplace.

RESEARCH PROJECT EXPERIENCES

Research on RL and Multi-modal Reasoning of Vision Language Models (VLMs) 04/2025-12/2025

Dr. Zhiding Yu (NVIDIA, mentor)

- **Pioneered a diverse, domain-specific dataset framework** to tackle challenges in visual reasoning for small-scale (2B-level) VLM training. This framework helped clarify which tasks were suitable for reasoning and enabled effective multi-stage distillation, allowing our 2B model to achieve performance comparable to much larger models on benchmarks like MMMU and MathVista.
- **Contributed this refined dataset to NVIDIA's Nemotron-VL and Issac Gr00t series**, making it a core component of their reasoning training pipeline and thus enhancing reasoning capabilities across NVIDIA's entire LLM suite.

Chemical Large Language Models and Agents 08/2023-04/2025

Prof. Wanli Ouyang (Shanghai AI Lab and CUHK, supervisor) and Dr. Yuqiang Li (Shanghai AI Lab, mentor)

- **Innovatively applied LLMs to chemistry** at a time when existing models struggled with basic molecule generation. We worked directly with chemists to understand their needs, then built a template-driven dataset from sources like PubChem and reaction databases. This allowed our model to handle chemistry Q&A far better than GPT-3.5 on domain tasks.
- **Extended these methods to multimodal tasks,** enabling the LLM to interpret chemical diagrams and visual inputs using LLaVA. This made it a powerful tool in both text and visual chemistry domains, outperforming previous models on our custom test sets.

Efficient Deep learning on Edge devices 09/2021-06/2022

Prof. Song Han (MIT, supervisor) and Dr. Ralph Huizi Mao (Stanford University, supervisor)

- Researched low-bit quantization techniques to deploy NN models efficiently on Qualcomm Hexagon devices

Research on Embodied human-computer interaction of humanoid robot 09/2019-06/2022

Prof. Bei Hua, and Prof. Xiaoping Chen (USTC, supervisor)

- **Explored the security aspects of embodied human-robot interaction** and integrated advanced NLP and dialogue systems to enhance robot autonomy. Contributed to the "Jiajia" service robot and the "Xiaochuan" Giant Panda Robot projects, aligning with modern trends in embodied learning for more intuitive and context-aware human-robot collaboration.

OTHER INTERN EXPERIENCES

- Microsoft Research Asia 03/2021-06/2021
  Position: Intern *Dr. Xu Tan (Mentor)*
- ✓ Participated in the Talking face with upper body gestures project
- Ant group (Alibaba Inc.) 06/2021-09/2021
  Position: Intern algorithm engineer *Engineer Bao Liu and Raul Chen (Mentor)*
- ✓ Internship in the Computational Intelligence department, CTO line, Ant Group.
- ✓ Participated in the development of Ray core and PyMars.