Xufeng Zhao

Ph.D. Candidate

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WHY ME?

Solid interdisciplinary background and systematic expertise in AI: with a BSc in Electronic Information Engineering, an MSc in Digital Signal Processing, and 6+ years of AI research in both industry and academia, my work spans large language models, multimodal perception, reinforcement learning, and robotics, forming a synergistic research interest triangle:

• Large Language Models (knowledge representation & flexible retrieval)
• Reinforcement Learning (exploration & policy optimization)
• Robotics (embrace the real world!)

Driven and capable, I am passionate about advancing embodied intelligence and generative AI through impactful, cross-disciplinary research.

ACTIVITIES

- 2024 • oral presentation at **ICRA@40**, Rotterdam,
- 2024 • oral presentation at **COLING**, Turin, Italy
- 2023 • oral presentation at **IROS**, Detroit, USA
- 2023 • poster presentation at **ICML**, Hawaii,
- 2022 • oral presentation at **IROS**, Kyoto, Japan

REVIEWS

- 2025 • IROS x3 #conference
- 2025 • Ubiquitous Robots (UR) #conference
- 2025 • RAS #journal
- 2025 • RA-L #journal
- 2024 • ICLR x3 #conference
- 2024 • ICRA x2 #conference
- 2024 • EMNLP #workshop
- 2024 • Humanoids #conference
- 2024 • IROS x2 #conference
- 2024 • COLING #conference
- 2023 • PeerJ Computer Science #journal

EDUCATION

University of Hamburg — Hamburg, DE
2021 – 2025 • Ph.D. in Computer Science

Supervisor: Prof. Dr. Stefan Wermter. Focusing on intelligient robot development with reinforcement learning, multimodal representation learning and large language models.

University of Chinese Academy of Sciences — Beijing, CN
2015 – 2018 • M.S. in Communication and Information

Supervisor: Prof. Dr. Daojing Li. Worked in areas of digital signal processing, e.g., multipath clutter suppression, denoising and machine learning.

Xidian University — Xi'An, CN
2010 – 2014 • B.E. in Electronic Information Engineering

WORK EXPERIENCE

JD.COM, Inc. — Beijing, CN
2018 – 2020 • Artificial Intelligence Algorithm Engineer

Leveraging JD.com's extensive e-commerce platform and big data infrastructure, I contributed to multiple projects aimed at driving profit growth, reducing operational costs, and enhancing user experience. Key projects included:

- Sales forecasting and product recommendation for smart vending machines (**time-series forecasting & recommender systems**)
- Medical information recognition for smart medical boxes (**computer vision**)
- Automated customer service system for after-sales orders and inquiries (**natural language processing & machine learning**)
- Harmful content detection in real-time messaging between merchants and customers (**natural language processing**)
- Quality assessment and ranking of consumer reviews with images and text (computer vision)

Extantfuture.com, Inc. — Beijing, CN
2015 – 2015 • Signal Processing Engineer

Contributed to the development of an innovative **wearable device** for pregnant women that passively collects multisensory data without requiring active transmission. The accompanying mobile App offers real-time monitoring of fetal health, ensuring comprehensive care for both the fetus and the mother. My primary responsibility was the development of a signal processing system to monitor fetal heart rate, fetal movement, and the mother's basic activities.

AWARD & GRANTS

- 2024 • ICRA@40 Travel Grants - IEEE Robotics and Automation
- 2024 • Researcher Access Program of OpenAI - OpenAI
- 2017 • Academic Scholarship - University of Chinese Academy of
- 2016 • Academic Scholarship - University of Chinese Academy of
- 2015 • Academic Scholarship - University of Chinese Academy of
- 2015 • Excellent Student Cadre - University of Chinese Academy of
- 2015 • Triple-A Student - University of Chinese Academy of
- 2013 • The Second Prize of China Undergraduate Mathematical Contest in Modeling - China Society for Industrial and Applied Mathematics
- 2012 • The Second Prize of Xidian's Electronic Competition - Xidian University
- 2012 • The First Prize of Xidian's Mathematical Contest in Modeling - Xidian University

TALKS

RL, LLM Boosted Agents (at a robotic company, 2024)

SKILLS

Python
Matlab
C/C++

LANGUAGES

Chinese
english
German

TEACHING

Thesis Supervision

Task-Agnostic Policy Distillation: Continual Deep Reinforcement Learning with Alternating Self-Supervised Prediction, Kerim Erekmen, BSc thesis, 2023, University of Hamburg.

Seminar Supervision

- Robust RGB-D to 3D mesh Construction for Robotic Simulation, Neural Networks Seminar 2024, University of Hamburg
- LLM Fine-tuning with News Data, Bio-inspired Artificial Intelligence Seminar 2023, University of Hamburg
- Survey on Deployable LLMs, Neural Networks Seminar 2023, University of Hamburg
- Unsupervised Skill Discovery Implementation, Bio-inspired Artificial Intelligence Seminar 2022, University of Hamburg
- Survey on Transformers in Reinforcement Learning, Bio-inspired Artificial Intelligence Seminar 2022, University of Hamburg
- …

Lecture

Lectures on large language models, 2024 master course on neural networks, University of Hamburg

PUBLICATIONS

as 1st author

1. **Xufeng Zhao**, Cornelius Weber, and Stefan Wermter. 'Agentic Skill Discovery'. In: *8th Conference on Robot Learning (CoRL 2024) Workshop on Language and Robot Learning: Language as an Interface (LangRob), Munich, Germany*. Aug. 2024
2. **Xufeng Zhao**, Mengdi Li, Wenhao Lu, Cornelius Weber, Jae Hee Lee, Kun Chu, and Stefan Wermter. 'Enhancing Zero-Shot Chain-of-Thought Reasoning in Large Language Models through Logic'. In: *Proceedings of the 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING 2024)*. Ed. by Nicoletta Calzolari, Min-Yen Kan, Veronique Hoste, Alessandro Lenci, Sakriani Sakti, and Nianwen Xue. Torino, Italia, May 2024, pp. 6144-6166
3. **Xufeng Zhao**, Mengdi Li, Cornelius Weber, Muhammad Burhan Hafez, and Stefan Wermter. 'Chat with the Environment: Interactive Multimodal Perception Using Large Language Models'. In: *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2023, pp. 3590-3596
4. **Xufeng Zhao***, Mengdi Li*, Jae Hee Lee, Cornelius Weber, and Stefan Wermter. 'Internally Rewarded Reinforcement Learning'. In: *Proceedings of the 40th International Conference on Machine Learning (ICML)*. Ed. by Andreas Krause, Emma Brunskill, Kyunghyun Cho, Barbara Engelhardt, Sivan Sabato, and Jonathan Scarlett. Vol. 202. Proceedings of Machine Learning Research. PMLR, July 2023, pp. 20556-20574
5. **Xufeng Zhao**, Cornelius Weber, Muhammad Burhan Hafez, and Stefan Wermter. 'Impact Makes a Sound and Sound Makes an Impact: Sound Guides Representations and Explorations'. In: *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2022, pp. 2512-2518

as co-author

6. Mengdi Li*, Jiaye Lin*, **Xufeng Zhao**, Wenhao Lu, Peilin Zhao, Stefan Wermter, and Di Wang. 'Curriculum-RLAIF: Curriculum Alignment with Reinforcement Learning from AI Feedback'. In: arXiv:2505.20075 (May 2025) [Under Review in NeurIPS 2025.]
7. Kun Chu, **Xufeng Zhao**, Cornelius Weber, and Stefan Wermter. 'LLM+MAP: Bimanual Robot Task Planning Using Large Language Models and Planning Domain Definition Language'. In: arXiv:2503.17309 (Mar. 2025) [Under Review]
8. Wenhao Lu, **Xufeng Zhao**, Josua Spisak, Jae Hee Lee, and Stefan Wermter. 'Mental Modelling of Reinforcement Learning Agents by Language Models'. In: *Transactions on Machine Learning Research (TMLR)* (2025), pp. 2835–8856
9. Honggen Zhang, **Xufeng Zhao**, Igor Molybog, and June Zhang. 'REAL: Response Embedding-Based Alignment for LLMs'. In: arXiv:2409.17169 [IJCAI 2025 Workshop on Causal Learning RecSys.]
10. Xiaowen Sun, **Xufeng Zhao**, Jae Hee Lee, Wenhao Lu, Matthias Kerzel, and Stefan Wermter. 'Details Make a Difference: Object State-Sensitive Neurorobotic Task Planning'. In: *Artificial Neural Networks and Machine Learning (ICANN)*. Ed. by Michael Wand, Kristína Malinovská, Jürgen Schmidhuber, and Igor V. Tetko. Cham: Springer Nature Switzerland, 2024. pp. 261-275
11. Kun Chu, **Xufeng Zhao**, Cornelius Weber, Mengdi Li, Wenhao Lu, and Stefan Wermter. 'Large Language Models for Orchestrating Bimanual Robots'. In: *The 2024 IEEE-RAS International Conference on Humanoid Robots (Humanoids)*. 2024
12. Wenhao Lu, **Xufeng Zhao**, Thilo Fryen, Jae Hee Lee, Mengdi Li, Sven Magg, and Stefan Wermter. 'Causal State Distillation for Explainable Reinforcement Learning'. In: *Proceedings of the Third Conference on Causal Learning and Reasoning (CLeaR)*. Ed. by Francesco Locatello and Vanessa Didelez. Vol. 236. Proceedings of Machine Learning Research. PMLR, Apr. 2024, pp. 106-142
13. Wenhao Lu, **Xufeng Zhao**, Sven Magg, Martin Gromniak, Mengdi Li, and Stefan Wermter. 'A Closer Look at Reward Decomposition for High-Level Robotic Explanations'. In: *2023 IEEE International Conference on Development and Learning (ICDL)*. 2023
14. Kun Chu, **Xufeng Zhao**, Cornelius Weber, Mengdi Li, and Stefan Wermter. 'Accelerating Reinforcement Learning of Robotic Manipulations via Feedback from Large Language Models'. In: *7th Conference on Robot Learning (CoRL 2023) Workshop on Bridging the Gap Between Cognitive Science and Robot Learning in the Real World: Progresses and New Directions (CRL_WS), Atlanta, Georgia USA*. 2024

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15. Tingting Wang, **Xufeng Zhao**, Qiujian Lv, Bo Hu, and Degang Sun. "Density weighted diversity based query strategy for active learning." In 2021 IEEE 24th International Conference on Computer Supported Cooperative Work in Design (CSCWD), pp. 156-161. IEEE, 2021.