

Hongjue Zhao

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Education

University of Illinois Urbana-Champaign, *Ph.D. Student in Computer Science* Aug 2024 – Present

- *Advisor*: Prof. Tarek Abdelzaher
- *Research Interests*: i) Physics-informed machine learning for Cyber-Physical Systems, ii) The intersection of AI and Control

Zhejiang University, *B.Eng. in Automation* Sept 2019 – July 2023

- Received an *Honor Degree* in Chu Kochen Honors College,
- *Overall GPA*: 3.93/4.0 (88.39/100). *The last two years GPA*: 3.98/4.0 (89.33/100)

Experience

Research Assistant, *Zhejiang University – Hangzhou, China* July 2023 – June 2024

- *Advisor*: Prof. Zhi Wang
- Focused research about the intersection of AI and Control.

Research Intern, *William & Mary – Online* Oct 2021 – Aug 2024

- *Advisor*: Prof. Huajie Shao
- Focused on research about polynomial neural networks and Neural ODEs.

Selected Publications

WestWorld: A Knowledge-Encoded Scalable Trajectory World Model for Diverse Robotic Systems *ICML 2026 Spotlight*

- Yuchen Wang, Jiangtao Kong, Sizhe Wei, Xiaochang Li, Haohong Lin, Hongjue Zhao, Tianyi Zhou, Lu Gan, Huajie Shao*

Dywave: Event-Aligned Dynamic Tokenization for Heterogeneous IoT Sensing Signals *ICML 2026*

- Tomoyoshi Kimura, Denizhan Kara, Jinyang Li, Hongjue Zhao, Yigong Hu, Yizhuo Chen, Xiaomin Ouyang, Shengzhong Liu, Tarek Abdelzaher*

ODESteer: A Unified ODE-Based Steering Framework for LLM Alignment *ICLR 2026*

- Hongjue Zhao[†], Haosen Sun[†], Jiangtao Kong, Xiaochang Li, Qineng Wang, Liwei Jiang, Qi Zhu, Tarek Abdelzaher, Yejin Choi, Manling Li*, Huajie Shao*

RestoreML: Practical Unsupervised Tuning of Deployed Intelligent IoT Systems *DCOSS-IoT 2025 Best Paper*

- Jinyang Li, Yizhuo Chen, Ruijie Wang, Tomoyoshi Kimura, Tianshi Wang, You Lyu, Hongjue Zhao, Binqi Sun, Shangchen Wu, Yigong Hu, Denizhan Kara, Beitong Tian, Klara Nahrstedt, Suhas Diggavi, Jae H Kim, Greg Kimberly, Guijun Wang, Maggie Wigness, Tarek Abdelzaher*

A Generalizable Physics-Enhanced State Space Model for Long-Term Dynamics Forecasting in Complex Environments *ICML 2025*

- Yuchen Wang, Hongjue Zhao, Haohong Lin, Enze Xu, Lifang He, Huajie Shao*

Accelerating Neural ODEs: A Variational Formulation-based Approach *ICLR 2025*

- Hongjue Zhao, Yuchen Wang, Hairong Qi, Zijie Huang, Han Zhao, Lui Sha, and Huajie Shao*

CAT: Interpretable Concept-based Taylor Additive Models

KDD 2024 Best Paper

- Viet Duong, Qiong Wu, Zhengyi Zhou, Hongjue Zhao^{*}, Chenxiang Luo, Eric Zavesky, Huaxiu Yao, and Huajie Shao^{*}

[†] indicates equal contribution, and ^{*} indicates corresponding authors.

Projects

ODESteer

2025 – 2026

- Proposed a unified framework for activation steering in LLM alignment based on ODEs and barrier functions in control theory
- Proposed a new steering method called ODESteer derived from the our ODE-based unified framework
- *Corresponding Paper*: ODESteer: A Unified ODE-Based Steering Framework for LLM Alignment
- *Tool used*: Python (Pytorch)

VF-NODE

2023 – 2025

- Proposed a kind of accelerating technique for Neural ODEs based on the variational formulation of ODEs
- Significantly accelerated the training of Neural ODEs about 10 to 1000 $\times$
- *Corresponding Paper*: Accelerating Neural ODEs: A Variational Formulation-based Approach
- *Tool used*: Python (JAX)

TaylorNet

2022 – 2024

- Designed a novel polynomial-based neural architecture
- Utilized Tucker decomposition to reduce the computational complexity
- *Corresponding Paper*: CAT: Interpretable Concept-based Taylor Additive Models
- *Tool used*: Python (Pytorch)

Skills

- **Languages**: English, Mandarin Chinese
- **Programming Skills**: Python (Pytorch/JAX), C/C++, Matlab, etc.
- **Hardware Tools**: Arduino, Raspberry Pi