

# Shaobo Wang | M.Eng. Student at SJTU

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## Education

### Shanghai Jiao Tong University

Computer Science, advised by Prof. Junchi Yan

Rank: 2/81, GPA: 3.98/4.0

Research Area: Trustworthy Machine Learning, Computer Vision, Theory of Foundation Model

**M.Eng.**

Sept 2022 – Mar 2025 (expected)

### Harbin Institute of Technology

Software Engineering

Rank: 1/183, GPA: 3.96/4.0

**B.Eng.**

Sept 2018 – Jun 2022

### Harvard University & Massachusetts Institute of Technology

Artificial Intelligence and Robotics

**Visiting Program**

Aug 2020

## Publications & Preprints

\* denotes equal contribution.

### Visualizing the Emergence of Intermediate Visual Patterns in DNNs

Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021)

Mingjie Li, Shaobo Wang, Quanshi Zhang.

R01

### Towards Understanding and Improving Dataset Distillation with Gradient Dynamics Correction

under submission to NeurIPS, 2024

Shaobo Wang, Qilong Wang, Yantai Yang, Kaixin Li, Junchi Yan

R02

### Unified Batch Normalization: Identifying and Alleviating the Feature Condensation in Batch Normalization and a Unified Framework

arxiv preprint, under submission to ECCV, 2024

Shaobo Wang, Xiangdong Zhang, Dongrui Liu, Junchi Yan

R03

### Trap of Feature Diversity in the Learning of MLPs

arxiv preprint, 2022

Dongrui Liu\*, Shaobo Wang\*, Jie Ren, Kangrui Wang, Sheng Yin, Huiqi Deng, Quanshi Zhang

R04

### Extracting Consistent Attribution Values *w.r.t.* Different Partitions of Input Variables

under submission, 2023

Shaobo Wang\*, Huiqi Deng\*, Hanying Zhang, Quanshi Zhang.

R05

### Think2Drive: Brick by Brick to Build a Model-based RL Agent for Quasi-Realistic Autonomous Driving (in CARLA-v2)

under submission to ECCV, 2024

Qifeng Li, Xiaosong Jia, Shaobo Wang, Junchi Yan

R06

## Research & Industry Experience

### Research Assistant

Department of Statistics and Data Science, Yale University

LLM Theory, under supervision of Prof. Zhuoran Yang.

Mar 2024 – now

### Research Assistant

ReThinklab, Shanghai Jiao Tong University

Explainable AI and Autonomous Driving, under supervision of Prof. Junchi Yan.

Aug 2023 – now

- Proposed a theoretical understanding of dataset distillation for the first time in this research line, designed a new method and obtained SOTA performance on current benchmark datasets[R02].
- Discovered the feature condensation phenomenon in the learning of normalization-based neural networks and designed a unified normalization framework that generates SOTA performance on visual tasks[R03].

## Research Collaboration

Research institute, COWA ROBOT

Aug 2023 – Dec 2023

Autonomous Driving, under supervision of Prof.Junchi Yan.

- In charge of the design and optimization of student module (perception and control) in the End2End autonomous driving system in the renowned CARLA-v2 simulator[R05].

## Research Intern

John Hopcroft Center for Computer Science, Shanghai Jiao Tong University

Jun 2020 – Aug 2023

Explainable AI, under supervision of Prof.Quanshi Zhang.

- Worked on visualizing the knowledge points learned by neural networks temporarily and spatially to analyze its behaviour and dynamics[R01].
- Investigated and theoretically explained a fundamental yet counter-intuitive two-phase phenomenon of feature diversity in the early learning of MLPs[R03].
- Proposed a learning-based faithful attribution method to reduce the inconsistency of the attribution values such as the classic Shapley value[R04].

## Research Collaboration

Microsoft Research Asia, Social Computing Group

Jun 2022 – Dec 2022

Responsible AI Research, under supervision of Dr.Xiting Wang.

- Participated in the design of a Responsible NLP benchmark.

## Research Intern

Institute for Interdisciplinary Information Sciences, Tsinghua University

Feb 2021 – Jun 2021

Multimodal Learning, under supervision of Prof.Hang Zhao.

- Participated in auto-foley projects with multimodal learning techniques.

## Research Intern

Department of Earth System Science, Tsinghua University

Mar 2020 – July 2020

Remote Sensing, under supervision of Dr.Zhichao Li.

- Participated in COVID-19 outbreak prediction in Brasilia and proposed to combine multimodal information to improve the accuracy.

## Academic Services

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### Conference Reviewer:

ICML 2022-2024, NeurIPS 2022-2023, CVPR 2023-2024, EMNLP 2022-2023, ACL 2023

## Selected Honors and Awards

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### Most Influential Graduate Student (< 0.05%)

Harbin Institute of Technology

Mar 2022

### Outstanding Graduate Student

Shandong Province, China

Mar 2022

### Outstanding Graduate Student

Harbin Institute of Technology

Mar 2022

### National Scholarship

Ministry of Education, China

Oct 2019

## Competitive Skills & Hobbies

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- **TOEFL iBT:** 103 Listening(28), Speaking(22), Reading(26), Writing(27)
- **Deep Learning Frameworks:** Pytorch, TensorFlow(2.0), Fast.ai.
- **Programming Languages:** C, C++, Java, Python,  $\LaTeX$ , HTML/CSS/Javascript.
- **Chess:** National Level-2 Athlete, championship record holder in Anhui, China.
- **Piano:** Co-played with Lang Lang (one of the Most Talented Pianists in the world).
- **Vocal:** Multiple awards in vocal and singing competitions.