Yichen Wang

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EDUCATION

University of Wisconsin-Madison **Madison, US**

PhD, Department of Computer Sciences 2025.9 - present

Advisor: Prof. Yudong Chen

Shanghai Jiao Tong University **Shanghai, CHN**

BS, Department of Automation 2021.9 - 2025.6

EXPERIENCE

University of Warwick **Coventry, UK**

Visiting Student, Department of Computer Science 2024.9 - 2024.12

Advisor: Prof. Fanghui Liu

RESEARCH INTEREST

My research interests lie in statistical learning theory and high-dimensional statistics. I develop theoretical foundations for modern machine learning, with a particular interest in generalization, optimization, and neural scaling laws.

PUBLICATIONS

- **Yichen Wang**, Fanghui Liu and Yudong Chen. **From Spectra to Joint Schedules in LLM Pre-training: 3+3(+2) Scaling-Law Regimes.** *arXiv preprint*, 2026.
  [TLDR: We characterize when spectral structure produces power-law learning curves and how learning-rate and batch-size schedules change them, with empirical validation in LLM pre-training.]
- **Yichen Wang**, Yudong Chen, Lorenzo Rosasco and Fanghui Liu. **The φ Curve: The Shape of Generalization through the Lens of Norm-based Capacity Control** *39th Conference on Neural Information Processing Systems (NeurIPS)*, 2025.
  [TLDR: We precisely characterize how the generalization learning curve behaves under a suitable model capacity and rigorously prove (Fig. 8.12, CS229 Lecture Notes).]
- **Yichen Wang**, Qiming Liu, Zhe Liu, and Hesheng Wang. **Enhancing Exploratory Capability in Visual Navigation using Uncertainty of Implicit Scene Representations.** *37th IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024. (Oral)

AWARDS & HONORS

- **National First Prize**, "TI Cup" China Undergraduate Electronics Design Contest. (Top1%) 2023
- **Shanghai Outstanding Graduate.** (Top5%) 2025
- **Second Price**, Academic Scholarship of Shanghai Jiao Tong University 2023, 2024

TALKS

- IFDS Seminar, Scaling Laws of Neural Networks under Staged GD Dynamics, UW−Madison 2026

TEACHING

- CS 540: Introduction to AI, Teaching Assistant, UW–Madison Fall 2026
- CS 639: Foundation Model, Teaching Assistant, UW–Madison Spring 2026
- CS 200: Programming I, Teaching Assistant, UW–Madison Fall 2025

REFERENCES

- **Yudong Chen**
  - Associate Professor at Department of Computer Sciences, UW-Madison, USA.
  - yudong.chen@wisc.edu
- **Fanghui Liu**
  - Assistant Professor at Department of Computer Science, University of Warwick, UK.
  - fanghui.liu@warwick.ac.uk
- **Xiaolin Huang**
  - Full Professor at Department of Automation, Shanghai Jiao Tong University, China.
  - xiaolinhuang@sjtu.edu.cn