

Ning Lin

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Education Background

- **Renmin University of China, Gaoling School of Artificial Intelligence** Sep. 2024 - Present
M.S. candidate in Artificial Intelligence
Beijing, China
 - Advisors: Prof. [Hao Sun](#) and Prof. [Wenbing Huang](#).
 - Research Interests: Physics-informed deep learning, embedding physical and symmetry constraints into neural networks; geometric deep learning and AI for Science; constrained scientific modeling and design.
- **Renmin University of China, Gaoling School of Artificial Intelligence** Sep. 2020 - Jun. 2024
B.Eng. in Artificial Intelligence
Beijing, China
 - Outstanding Graduate of Beijing.

Selected Papers (* denotes equal contribution)

- [1] **Ning Lin**, Jiacheng Cen, Anyi Li, Wenbing Huang, Hao Sun, [Reducing Symmetry Increase in Equivariant Neural Networks](#), *International Conference on Learning Representations (ICLR 2026)*.
- [2] **Ning Lin***, Luxi Chen*, Huaguan Chen, Jiacheng Cen, Chongxuan Li, Wenbing Huang, Hao Sun, [Planar Symmetric Pattern Generation](#), *International Conference on Machine Learning (ICML 2026)*.
- [3] Huaguan Chen*, **Ning Lin***, Luxi Chen*, Jiacheng Cen, Rui Zhang, Wenbing Huang, Chongxuan Li, Hao Sun, [Optimization and Generation in Aerodynamics Inverse Design](#), *arXiv:2602.03582*.
- [4] Jiacheng Cen, Anyi Li, **Ning Lin**, Yuxiang Ren, Zihe Wang, Wenbing Huang, [Are High-Degree Representations Really Unnecessary in Equivariant Graph Neural Networks?](#), *Advances in Neural Information Processing Systems (NeurIPS 2024)*.
- [5] Jiacheng Cen, Anyi Li, **Ning Lin**, Tingyang Xu, Yu Rong, Deli Zhao, Zihe Wang, Wenbing Huang, [Universally Invariant Learning in Equivariant GNNs](#), *Advances in Neural Information Processing Systems (NeurIPS 2025)*.
- [6] Jian Li, Wan Han, **Ning Lin**, Yuliang Zhan, Ruizhi Chengze, Haining Wang, Yi Zhang, Hongsheng Liu, Zidong Wang, Fan Yu, Hao Sun, [SlotPi: Physics-informed Object-centric Reasoning Models](#), *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD 2025)*.
- [7] Huaguan Chen, Wei Han, Haofei Sun, **Ning Lin**, Xingtao Song, Yunfan Yang, Jie Tian, Yang Liu, Ji-Rong Wen, Xiaoye Zhang, Xueshun Shen, Hao Sun, [Nowcast3D: Reliable precipitation nowcasting via gray-box learning](#), *Nature Machine Intelligence*, under revision.

Research Experience

- **Symmetry Theory in Geometric Deep Learning** Sep. 2023 – Present
 - Studied parameterization and generation of symmetric objects, and degeneracy of equivariant neural networks under symmetric inputs, providing theory for equivariant feature selection.
 - Conducted modeling using group theory, differential geometry, and commutative algebra, with a systematic study of point group and planar group symmetries.
 - First-author publication at ICLR 2026 and ICML 2026.
 - Co-authored publications at NeurIPS 2024 and NeurIPS 2025.
- **3D Optimal Aerodynamic Shape Design** Mar. 2025 – Present
 - Studied 3D mesh optimization and generation for objects such as cars and aircraft under aerodynamic constraints
 - Developed controllable generative algorithms, including an improved variance estimation scheme inspired by quasi-Newton ideas and a distribution-consistent training loss of aerodynamic predictor.
 - Co-first-author journal manuscript in preparation for submission to *Nature Mechanical Engineering*
- **Physics-inspired Object-centric Perception Model** Sep. 2024 – Sep. 2025
 - Inspired by parameterizations of energy-conserving systems, developed models for perception in 3D physical scenes. Responsible for investigation of Hamiltonian systems and model construction.
 - Co-authored publication at SIGKDD 2025.
- **Machine Learning Lecture Notes** Sep. 2022 – Sep. 2024
 - Organized core teaching materials of introductory machine learning and conducted additional investigations based on the course content, documenting personal understanding and insights.
 - Produced over 200 pages of structured lecture notes covering regression, dimensionality reduction, clustering, and classification, with emphasis on theoretical foundations and mathematical derivations.

Selected Awards

- ICML 2026 Gold Reviewer Award, 2026
- Graduate Academic Scholarship, Renmin University of China, 2024-2025
- Outstanding Graduate of Beijing, 2024
- Outstanding Student Award, Renmin University of China, 2022-2023
- Undergraduate Academic Excellence Scholarship, Renmin University of China, 2022-2023

Academic and Community Services

- **Community Service:** Proctor and Technical Support, National Olympiad in Artificial Intelligence (NOAI) of China Region (Jun. 2024).
- **Teaching Assistant (in Renmin University of China):**
 - Fundamentals of Machine Learning (Feb. 2024 - Jun. 2024);
 - Youth Artificial Intelligence Training Camp (Jun. 2024; Jun. 2025);
 - Selected Topics in AI Practice and Applications (Sep. 2024 - Jan. 2025; Sep. 2025 - Jan. 2026);
 - Physics-informed Deep Learning (Feb. 2025 - Jun. 2025).
- **Conference Reviewer:** ICLR, ICML (Gold Reviewer Award in 2026), AAAI
- **Journal Reviewer:** TMLR

Invited Talks

- **Reducing Symmetry Increase in Equivariant Neural Networks**, SyncedTech, Beijing, China, Apr. 2026.
- **Reducing Symmetry Increase in Equivariant Neural Networks**, Beijing Academy of Artificial Intelligence (BAAI), Beijing, China, Apr. 2026.

Skills

- Programming: Python, C/C++, MATLAB, Mathematica
- Deep learning framework: PyTorch
- Scientific Computing: Numpy, Scipy, Sklearn, Biopython
- Language: Chinese, English