# Wang Likun

Objective：Phd

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## Education

**Beihang University** - **Transportation** - **Bachelor**                    Sep 2019 - Jun 2023

**GPA:** 3.8/4 (Rank 1/89)
**Core Courses:** Mathematical Analysis, Probability & Statistics, Linear Algebra, Data Structures, Operations Research, Principles of Automatic Control, Traffic Engineering, Fundamentals of Vehicle Technology
**Honors:** National Scholarship, Excellent Graduate of Beijing University, University-level Outstanding Student, Annual Excellent Student, Scholarship for Academic Excellence
**Competitions:** First Prize, 17th National Transportation Science & Technology Competition; Second Prize (Beijing), 7th "Internet+" Innovation and Entrepreneurship Competition

**Tsinghua University** - **Artificial Intelligence** - **Master**                    Sep 2023 - Present

**GPA:** 3.85/4
**Core Courses:** Deep Learning, Reinforcement Learning, Optimal Control, Vehicle Control Engineering, Numerical Analysis
**Honors:** 2023 Excellent Scholarship, Tsinghua–Shaanxi Automobile Grand Scholarship (2024, First-Class/Top Prize), "Star Graduate Student" of Q4 2023

## Scientific research achievements

**Off-policy Reinforcement Learning with Model-based Exploration Augmentation**

- **NeurIPS 2025 (First Author)**

- Designed a classifier-guided diffusion state generator with policy entropy and TD error as metrics, and built a pre-trainable one-step world model for both diffusion guidance and converting key states into transitions.
- Developed a joint training mechanism integrating MPGE with existing reinforcement learning algorithms, achieving dual improvements in performance and sample efficiency via approximate importance sampling, and reaching SOTA performance in multiple experiments on Gym and DMC tasks.

**Bootstrap Off-policy with World Model** - **NeurIPS 2025 (Corresponding Author)**

- Designed a likelihood-free alignment mechanism to directly align policy updates with the planner's non-parametric action distribution, avoiding distribution shift.
- Developed a prioritized replay update method focusing on high-return actions, reducing suboptimal interference, and improving stability and convergence.

**Enhanced DACER Algorithm with High Diffusion Efficiency** - **ICLR2026 (Under review, First Author)**

- Proposed **DACER-Pro**, an efficient online reinforcement learning algorithm that accelerates diffusion-based policies using an auxiliary Q-gradient objective and temporal weighting, achieving state-of-the-art performance on complex control tasks with only five diffusion steps.

**Mind Your Entropy: From Maximum Entropy to Trajectory Entropy-Constrained RL**

- **ICLR2026 (Under review, First Author)**

- Proposed TECRL, a reinforcement learning framework that regulates exploration through trajectory-level entropy control.
- Enables stable value learning and significantly improves performance and sample efficiency. Results show that trajectory entropy regularization provides a powerful and generalizable enhancement to maximum-entropy RL.

**IDC-Ped: An Extended Social Force Model for Urban Pedestrian Behavior Modeling**

- **TITS (Under Review, First Author)**

- Developed a high-fidelity pedestrian behavior model with improved human–vehicle interaction mechanisms, enhancing realism and performance in autonomous driving simulations.

**DACER: Diffusion Actor-Critic with Entropy Regulator** - **NeurIPS 2024 (Second Author)**

- Introduced diffusion models as policy approximators with multimodal capacity and entropy regulation, achieving SOTA exploration performance in RL benchmarks.

**Controllability Test for Nonlinear Datatic Systems**

- **Communications in Transportation Research (Second Author)**

- Proposed a controllability test method for data-driven control systems by introducing the concept of "neighborhood controllability," which extends the traditional point-to-point definition to a point-to-region form, making it more suitable for dynamic systems described by limited data.

**ODE-based Smoothing Neural Network for Reinforcement Learning Tasks** - **ICLR2025 (spotlight)**

Proposed an improved Neural ODE, enhancing action smoothness and robustness for deep RL control tasks.

## Internship experience

**DiDi** - **Autonomous Driving Algorithm Intern** <span style="float:right">Jul 2025 - Present</span>

- **Project Description:** Designed a dual-coupled RSSM world model and trained downstream reinforcement learning algorithms with hybrid losses, enabling reinforcement learning algorithms tailored for autonomous driving scenarios.
- **Development Responsibilities:** Designed the architecture of the world model and the joint policy loss, and implemented code development.
- **Expected Outcome:** A deployable world-model-based reinforcement learning solution for autonomous driving.

**Risenlighten Technology** - **Algorithm Intern** <span style="float:right">Jun 2022 - Jan 2023</span>

- **Project Description:** Developed an autonomous driving simulation platform (LasVsim) for urban road scenarios.
- **Development Responsibilities:** Designed and implemented the traffic flow model of the simulation platform.
- **Result:** Built a microscopic vehicle behavior model based on an improved MOBIL model, capable of reproducing realistic multi-directional vehicle conflicts at intersections.

## Project experience

**Development of End-to-End Autonomous Driving Algorithms Based on Reinforcement Learning**

<span style="float:right">Feb 2025 - Present</span>

- **Project Description:** Trained end-to-end autonomous driving policies by inputting goal-set features into reinforcement learning.
- **Development Responsibilities:** Designed the PLANet encoding framework and applied a Transformer encoder for multi-dimensional state representation, encoding high-dimensional inputs into a stable latent space for reinforcement learning training.
- **Result:** The model achieved strong performance in multi-lane and intersection simulations.

**Design of Data Watermarking for Autonomous Driving Based on Reinforcement Learning** <span style="float:right">Aug 2024 - Mar 2025</span>

- **Project Description:** To address the conflict between the replicability of autonomous driving data and data ownership, a reinforcement learning-based robust watermarking method is designed, which enables watermark embedding and recognition with minimal impact on the original data.
- **Development Responsibilities:** Built an ADP-based RL watermark embedding framework, using two MDPs within the same loop to describe the embedding and recognition processes, and introduced reconstruction and recognition errors for adversarial generative training.
- **Result:** Demonstrated strong performance in industrial control systems; currently leading a team to train and optimize the method for autonomous driving data.

**Hierarchical Regional Traffic Signal Control Based on Reinforcement Learning** <span style="float:right">Jan 2022 - Jul 2022</span>

- **Project Description:** Designed a multi-agent reinforcement learning control algorithm to develop signal timing schemes for regional intersections.
- **Development Responsibilities:** Built a two-layer optimization structure, where the lower layer handled basic signal control for single intersections, and the upper layer performed regional joint optimization.
- **Result:** Won the First Prize in the 2022 National College Student Transportation Science and Technology Competition.

## Skills

- **Languages:** CET-6 (528), GRE (319), proficient in English communication, reading, and writing.
- **Programming:** Proficient in Python, PyTorch, Git, and LaTeX.
- **Teamwork:** Experienced in team building, project management, and coordination.

## Self-evaluation

- Highly conscientious and detail-oriented, with strong responsibility and problem-solving skills.
- Proactive in identifying, analyzing, and resolving challenges with solid analytical ability.
- Diligent, eager to learn, and hands-on, with a strong sense of social responsibility.
- Persistent and resilient, able to work under pressure and motivated to embrace new challenges.