

Weihaio Sun

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EDUCATION

Cornell University

Ph.D. Student in Systems Engineering

Topics: Multi-agent Systems, Reinforcement Learning, Systems and Control

Advisor: [Dr. Andreas A. Malikopoulos](#)

Ithaca, United State

Starting August 2026

Cornell University

M.S. & M.Eng. in Systems Engineering

Relevant Courses: Model Based Systems Engineering (A), Optimal Control and Decision Theory (A+), Systems Analysis Behavior and Optimization (A), Machine Learning for Feedback Systems (A), Robot Learning (In Progress)

Topic: Learning and Control for Transportation Systems with Human Interaction.

Advisor: [Dr. Andreas A. Malikopoulos](#)

Ithaca, United State

August 2024 – May 2026

University of British Columbia

Bachelor of Science in Statistics | Minor in Data Science

Relevant Courses: Calculus (A+), Probability (A), Statistical Inference (A-), Machine Learning (B+), Statistical Learning (B+), Statistical Modelling (A), Trustworthy Workflows for Data Science (A-), Data Fairness (A+)

Vancouver, Canada

August 2019 – May 2024

PUBLICATIONS

Sun, W., Xu, G., Moreschini, A., Parisini, T., and Malikopoulos, A.A., “A Functional Learning Approach for Team Optimal Traffic Coordination,” Submitted to the 65th **IEEE Conference on Decision and Control (CDC)**, 2026, **in review**.

Wang, S., **Sun, W.**, and Malikopoulos, A.A., “An Online Learning Approach for Two Player Zero Sum Linear Quadratic Games,” Submitted to the 65th **IEEE Conference on Decision and Control (CDC)**, 2026, **in review**.

Sun, W., Bang, H., and Malikopoulos, A.A., “AI Recommendation Systems for Lane-Changing Using Adherence-Aware Reinforcement Learning,” Proceedings of the 28th **IEEE International Conference on Intelligent Transportation Systems (ITSC)**, pp. 1060–1065, 2025.

RESEARCH EXPERIENCE

Multi-Robot Communication and Coordination

February 2026 – Present

IDS Lab, Cornell University

- Ongoing: Developing learning-based frameworks to improve coordination and communication efficiency across heterogeneous robot teams, addressing challenges of overcoming communication delays or mismatches.
- Exploring methods related to multi-agent reinforcement learning (MARL), graph neural networks (GNN), and transformer based structure, to derive an optimal path planning strategy under imperfect information sharing.

Functional Learning Approach for Team Optimal Traffic Coordination

February 2026 – Present

IDS Lab, Cornell University

- Developed a kernel based functional learning framework for team optimal traffic coordination in multi agent systems, with applications to signal free intersection management.
- Studied both offline and online receding horizon settings with unknown dynamics estimation, and validated the approach through simulation and SUMO based experiments.
- This paper is submitted to the 65th IEEE Conference on Decision and Control (CDC) and currently is under review.

Adherence-Aware Reinforcement Learning for Lane Changing

October 2024 – April 2025

IDS Lab, Cornell University

- Designed and implemented a novel adherence-aware reinforcement learning (RL) framework for lane-changing decision recommendations in semi-autonomous driving environments, to address the gap when human drivers do not fully comply with the AI recommendations.
- Implemented an adherence-aware deep Q-network algorithm, compared with other regular RL algorithms, simulated and evaluated the result in CARLA autonomous driving simulator.
- This paper is published on Proceedings of the 2025 IEEE International Conference on Intelligent Transportation Systems.

Clinical Decision Support for Post-Pregnancy Loss Mental Health

September 2024 – May 2025

Cornell University | Supervisor: [Dr. Clifford Alan Whitcomb](#), [Dr. Yiye Zhang](#)

- Contributing to the development of a clinical decision support system for post-pregnancy loss (PPL) mental health, addressing the current gap in predictive methods for early depression risk alerts.
- Performing data analysis and modeling on PRAMS healthcare data using statistical and machine learning models to uncover key social and clinical determinants of mental health outcomes, and integrating from a systems engineering perspective.

Physics-Informed Neural Networks for Battery Modeling

November 2021 – April 2022

University of British Columbia | Supervisor: [Maricela Best McKay](#) (Ph.D. Student at University of British Columbia)

- Contributed to a research project as a research assistant by applying Physics-Informed Neural Networks (PINN) to solve partial differential equations in lithium-ion battery modeling, to improve battery charging efficiency.
- Generated data from PyBAMM, developed and analyzed the PINN model to study concentration dynamics.

WORKING EXPERIENCE

Cornell University | Teaching Assistant

September 2025 – December 2025

- Grading assignments and exams for SYSEN 5220, Systems Dynamics. Assisting the instructor in preparing class materials.

CSCEC International Construction Co., LTD. | Data Analyst Intern

June 2024 – August 2024

- Analyzed purchase data for over 50 construction projects, identifying trends and patterns to optimize procurement processes, resulting in a 5% reduction in costs.
- Developed and maintained data dashboards, increasing reporting efficiency by over 30% and supporting decision-making.

Triple Eagle Logistics Vancouver | Data Engineer Intern

May 2022 – August 2022

- Developed, tested, and maintained an internally used automatic bill calculation system. Updated and maintained database

TECHNICAL PROJECTS

IDS3C Scaled City

August 2025 – Present

IDS Lab, Cornell University

- Participated in implementing and maintaining a large scale smart city robotics testbed for connected autonomous vehicles and mobile robots, supporting real world experiments in multi-agent traffic control.
- Integrated hardware and software components using ROS2 and C++, including vehicle calibration, map and route configuration, controller deployment, and system debugging, to ensure operational reliability.
- Embedded and tested coordination algorithms, designed new experimental scenarios for different research projects.

Forecasting the Demands for Urgent Care Service

July 2023 – February 2024

Team Project, Borealis AI & University of British Columbia

- Applied and evaluated advanced machine learning models, including Neural Networks, Time Series models, etc., to predict local emergency department demands based on local healthcare facilities, climate, and rush-hour data. Achieved notable improvements in short-term forecasting accuracy.

ACADEMIC SERVICE

Reviewer: IEEE Intelligent Vehicles Symposium (IV)

Reviewer: IEEE International Conference on Intelligent Transportation Systems (ITSC)

AWARDS & CERTIFICATIONS

INCOSE Certification

December 2024

Faculty of Science Dean's Honor List, UBC

May 2023, May 2021, May 2020

Outstanding International Student Award, UBC

August 2019

LANGUAGE & TECHNICAL SKILLS

Programming Languages:

- **Proficient:** Python, R, SQL.
- **Familiar:** Matlab, C++, Java, Javascript, C#, Julia, Racket, Dart.

Frameworks: CARLA Simulator, SUMO, PyTorch, Django, Flask, Node.js.

Developer Tools: ROS, Git/Github, Jupyter Notebook, Docker.

Natural Languages: Mandarin (Native), English (Proficient), French (Beginner).