JUN XIANG

(919) 633-2921 ◇ San Diego, CA
jxiang@ucsd.edu ◇ github.com/Xiaoshan-jun

EDUCATION

PhD of Mechanical Engineering, University of California,San Diego/San Diego State University Expected 2025
Advisor: Professor Jun Chen, Professor Sonia Martínez GPA: 3.5
Master of Automotive Engineering, Clemson University 2019 - 2021
Area of Study: Autonomous Vehicle GPA:3.7
Bachelor of Mechanical Engineering, North Carolina State University 2015 - 2019

SKILLS

Programming:	python, C++, MATLAB, ROS, Arduino
Tools	TensorFlow, PyTorch, Weights&bias, Git, Docker, AWS, Spark, Hadoop, Simulink
Machine Learning	Foundation model, Multimodal learning, Distillation, GMM, Diffusion, Reinforcement learning, Reasoning , Fine tuning
Neural Network	Transformer, CNN, LSTM, GAN

EXPERIENCE

Research Assistant August 2021 - Present
UC San Diego/San Diego State University *San Diego, CA*

- Developed learning-accelerated and heuristic-enhanced algorithms, such as RRT* and A*, for efficient and risk-aware path planning in dynamic and uncertain environments.
- Proposed probabilistic and intention-conditioned models, including diffusion and GAN-based frameworks, to enable high-resolution, long-term trajectory forecasting for aircraft and UAV operations. Achieved state-of-the-art prediction accuracy across multiple aviation trajectory datasets.
- Designed self-supervised and imitation learning methods to construct convex approximations of probabilistic reachable sets from limited data for safety-critical applications.
- Created a distillation-based neural control framework that enhances robustness and reliability in decision-making systems under disturbances and modeling uncertainties.
- Collected trajectory data from drone swarms using a motion tracking system to create a comprehensive UAV dataset, and conducted real-world flight experiments to validate path planning and obstacle avoidance strategies.

Research Assistant August 2019 - August 2021
Collaborative Robotics and Automation Laboratory (CRA Lab) *Greenville, SC*

- proposed a Q-Learning controller to find a control policy to control the vehicle's acceleration during the car following to maximize ride comfort. A paper has been published on SAE WCX.
- Applied GANs to predict pedestrian motion with the dataset from the Lyft Motion Prediction for Autonomous Vehicles Challenge and Waymo Motion Prediction Challenge.
- Applied CNNs to determine passenger's emotion and recognize passenger's command by passenger's voice.
- Collected data such as fuel efficiency, speed, and brake history from real autonomous vehicles with CAN.

Image Recognition Engineer Intern June 2019 - August 2019
Toshiba-APG Intelligent Drive Lab *China*

- Applied deep learning network to screen and classify pictures of the rear view of the vehicles.
- Performed testing and calibration for vehicle electronics such as sensors, radars, and cameras.

Mechanical Engineer Intern July 2017 - September 2017
Yuco Optics Corporation *Bohemia, NY*

PUBLICATIONS

Journals

- Xiang, J., Martinez, S, Chen, J. (2025). **Robust neural network controller with distillation.** *IEEE Transactions on Automation Science and Engineering*(Submitted)
- Xiang, J., Chen, J. (2025). **Data-driven probabilistic trajectory learning with high temporal resolution in terminal airspace**. *Journal of Aerospace Information Systems*
- Xiang, J., Chen, J. (2024). **Convex Approximation of Probabilistic Reachable Sets from Small Samples Using Self-supervised Neural Networks**. *Engineering Applications of Artificial Intelligence.* (Submitted)
- Xiang, J., Liu, Y.C., Chen, J. (2022). **Hybrid Strategy with Multi-scale A* for Dynamic Planning of Multi-agent Drone Traffic**. *Journal of Guidance, Control, and Dynamics*
- He, Q., Xiang, J, et al. (2025) **3D-Printed programmable robotic skin with tunable toughness and surface-sensitive piezoelectric sensing**. *in process*

Conference Proceedings

- Xiang, J., Chen, X.W, Chen, J. (2025). **Intention guided flight trajectory prediction with reasoning model** . *AIAA Scitech 2026 Forum*(Submitted)
- Xiang, J., Yeh, J. Chen, J. (2025). **Context-Conditioned Diffusion Model for Long-Term Aircraft Trajectory Prediction Denoising from Pre-Generated Intention and Waypoints** . *Neural Information Processing Systems 2025*(Submitted)
- Xiang, J., Chen, J. (2025). **Learning-accelerated RRT* Search for Risk-aware Path Planning**. *AIAA Aviation 2025*
- Xiang, J., Chen, J. (2024). **Transformer-based Heuristic for Advanced Air Mobility Planning**. *IEEE/AIAA Digital Avionics Systems Conference (DASC) 2024*
- Xiang, J., Chen, J. (2024). **Imitation Learning-based Convex Approximations of Probabilistic Reachable Sets**. *AIAA Aviation 2024 Forum*
- Xiang, J., Chen, J. (2024). **Learning-accelerated A* Search for Risk-aware Path Planning**. *AIAA Scitech 2024 Forum*
- Xiang, J., Essick, D., Bautista, L.G., Xie, J.F., Chen, J. (2023). **Landing Trajectory Prediction for UAS Based on Generative Adversarial Network**. *AIAA Scitech 2023 Forum*
- Xiang, J., Amaya, V., Chen, J. (2022). **Dynamic Unmanned Aircraft System Traffic Volume Reservation Based on Multi-Scale A* Algorithm**. *AIAA Scitech 2022 Forum*
- Xiang, J., Guo, L. (2022). **Comfort Improvement for Autonomous Vehicles Using Reinforcement Learning with In-Situ Human Feedback**. *SAE Technical Paper*
- Gault, J., Xiang, J., Chen, J. (2023). **Safe Path Planning of UAV Based on Reinforcement Learning in Probabilistic Environments**. *AIAA Scitech 2023 Forum*