

JUSHAN (RANDY) CHEN

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EDUCATION

PhD in Electrical, Computer, and Systems Engineering , Rensselaer Polytechnic Institute	Jan 2025 - Sep 2028
Advisor: Dr. Santiago Paternain	
Research interests: optimal control, deep learning, reinforcement learning, robotic foundation models	
Master of Science in Aerospace Engineering , University of Illinois Urbana-Champaign	Aug 2022 - May 2024
Advisor: Dr. Negar Mehr	
Thesis: <i>Improved pose estimation accuracy of monocular deep visual odometry against dynamic entities via adversarial training</i>	
GPA: 3.74/4.00	
Bachelor of Science in Aerospace Engineering , University of Illinois Urbana-Champaign	Aug 2019 - May 2022
GPA: 3.77/4.00 Fall 2019 & Fall 2020 Dean's List	

SKILLS

Languages: Python, C++, MATLAB, Linux

Tools/Frameworks: PyTorch, Git, Simulink, Isaac Lab, CUDA, ROS, CVXPY, Casadi

Industry Expertise: feedback control, motion planning, hardware-in-the-loop testing

PUBLICATIONS

J. Chen, S. Paternain. "PAD-TRO: Projection-Augmented Diffusion for Direct Trajectory Optimization". [In Review]

J. Chen, S. Paternain. "Collaborative Multi-Robot Field Coverage: A Reinforcement Learning Approach via Closed-Loop Markov Potential Game". [In Review]

Z. Williams, J. Chen, N. Mehr. "Distributed Potential ILQR: Scalable Game-Theoretic Trajectory Planning for Multi-Agent Interactions". In Proc. of the *IEEE ICRA*, 2023. **[32 Citations]**

EXPERIENCE

Control Systems Intern DEKA Research & Development	Jun 2025 - Aug 2025 <i>Manchester, NH, USA</i>
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- Co-led a confidential robotics project at the Robotics & Perception group to develop motion planning algorithms on a robotic arm to automate biomedical and clinical experiments
- Implemented an entire collision-free motion planning framework in ROS2 as well as a Kalman Filter for robust state estimation and sensor fusion in C++
- Performed a live collision-free motion planning demo on a real DENSO robotic arm, helping the company's bidding for a contract at a well-known pharmaceutical company

Deep Learning Engineer Shandong Electric Power Consulting Co.,LTD	Jul 2024 - Dec 2024 <i>Remote, USA</i>
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- Led the company's R&D team to develop a deep convolutional neural network architecture for fault localization in 35kV power transmission lines based on synthetic data generated in a Simulink model built from scratch
- Achieved 98% accuracy in end-to-end fault region detection based on three-phase current

Graduate Teaching Assistant Dept. of Aerospace Engineering, University of Illinois Urbana-Champaign	Aug 2023 - May 2024 <i>Urbana, IL, USA</i>
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- Provided guidance and support for undergraduate students in numerical analysis class (AE370)
- Assisted students in wind tunnel experiments (AE460) for analyzing the airflow properties in incompressible and compressible flow regimes

Graduate Research Assistant Intelligent Controls Lab, University of Illinois Urbana-Champaign Advisor: Dr. Negar Mehr	Aug 2022 - May 2024 <i>Urbana, IL, USA</i>
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- Led a thesis research project in collaboration with researchers from UT Austin to develop a robust deep learning-based visual odometry model for pose estimation by leveraging adversarial training, resulting in a 64% improvement in pose estimation accuracy over the state-of-the-art baseline
- Developed a novel distributed trajectory planning algorithm for multi-robot systems using potential dynamic games, resulting in over a 40% reduction in computation times compared to a state-of-the-art centralized baseline. Conducted real-time experiments on the Crazyflie platform using ROS 2.0, demonstrating safety assurance