

Lixin Xu

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RESEARCH INTERESTS

I am deeply committed to advancing the field of robotics with a focus on the integration of cognitive and athletic intelligence to create robotics foundation models that could revolutionize our modern industry and society.

EDUCATION & INTERNSHIP

National University of Singapore <i>Singapore</i>	June 2024-Present
Research Intern, Supervisor: Prof. Lin Shao	
Georgia Institute of Technology <i>Atlanta, United States / Shenzhen, China</i>	Expected Dec 2024
M.Sc. in Electric and Computer Engineering	GPA: 4.0/4.0
• Coursework: ECE 6258 Digital Image Processing(A), ECE 6122 Adv Prog Techniques(A), ECE 6550 Linear Sys and Control(A), CS 7641 Machine Learning(A), CS 7643 Deep Learning(A), CS 7638 AI for Robotics(A), etc.	
Tianjin University <i>Tianjin, China</i>	Expected Jan 2025
M.Sc. in Instrument Science and Technology	GPA: 90.46/100
• National Scholarship, Ministry of Education of China	
Qingdao University <i>Qingdao, China</i>	June 2021
B.Sc. in Mechanical Engineering	GPA: 90.96 / 100 (Top 1%)
• National Scholarship, Ministry of Education of China	

SKILLSET

Programming and tools Python/PyTorch, C/C++, Isaac Gym, MATLAB/Simulink, ROS, Cmake, \LaTeX , Solidworks

ML & Decision Making Generative Models, Reinforcement Learning, LLM/VLM

Control & Actuation Nonlinear control, disturbance rejection control, dynamics modeling

Languages Mandarin(native), English(IELTS 7.5, GRE 322), German(A2), Japanese(N4)

ACADEMIC & PROJECT EXPERIENCE

Cross-embodied dexterous manipulation <i>National University of Singapore</i>	Jan. 2023 - Present
• Cross-embodied model on multiple end-effectors (Kinova, Leap, Allegro, Shadow Hand)	
• Pre-trained diffusion-based Reinforcement Learning in Isaac Gym environment	
Digital Twin-based Advanced Control of a Pneumatic Parallel Manipulator <i>Tianjin University</i>	Jan. 2023 - Present
• Publication: L. Zhao, L. Xu, et al., "Nonlinear Decoupling Control for a 3-PSS Pneumatic Parallel Manipulator with Rodless Pneumatic Cylinders", <i>IEEE/ASME Transactions on Mechatronics</i> (under review)	
• Kinematics and dynamics analysis, disturbance rejection control, nonlinear controllers and observers	
Dexterous hand with pneumatic artificial muscles <i>Tianjin University</i>	Jan. 2023 - Present
• Survey and design of anthropomorphic dexterous hand	
• Digital Twin based on SimScape and Isaac Sim platform.	
Monocular Depth Estimation - FADE Ain't Depth Estimation <i>CS 7643</i>	Feb 2022 - May 2022
• Involved deep learning experience on large-scale networks focusing on depth estimation.	
• Exploration and evaluation of current boosting methods with MiDaS and LeRes.	
An Attention-Based Video Inpainting Technique for Wire-Removal Scenarios <i>ECE 6258</i>	Sep 2021 - Dec 2021
• Hands-on experience on PyTorch, proposed an encoder-decoder-based model for inpainting.	
Universal Village Program <i>Boston, United States</i>	Jul 2020 - Apr 2021
• Intelligent transportation systems for smart cities with information flow, material cycle, lifestyle and community.	
• Publication: L. Xu et al., "Evaluation of Transportation Systems and Novel UV-Oriented Solution for Integration, Resilience, Inclusiveness and Sustainability," <i>2020 5th International Conference on Universal Village (UV)</i> , Boston, MA, USA, 2020.	
The 6th National Engineering Training Competition - Material Handling Robot <i>Special Prize</i>	Dec 2018 - Jun 2019
• Built a STM32-based Mecanum Wheel robot with OpenMV for object recognition.	