

XUAN LIU

(Curriculum Vitae, Updated on July, 2026)

CONTACT INFORMATION	185 Durham Hall, 1145 Perry Street Virginia Tech, Blacksburg, VA, 24060	PHONE EMAIL HOMEPAGE	+1 (540) 239-8135 xuanliu@vt.edu xuanliu2000.github.io
RESEARCH INTERESTS	Physics-informed machine learning, Neural operators for Metal AM Generative models, Reinforcement Learning, and Transfer learning,		
EDUCATION	Virginia Polytechnic Institute and State University (Virginia Tech) <i>Ph.D. in Industrial and System Engineering</i>	Blacksburg, VA, USA Aug 2024 - Present	
	Xi'an Jiaotong University (XJTU) <i>M.Eng in Mechanical Engineering</i> - Thesis: Research on Anomaly Detection and Key Component Fault Diagnosis of Bogie System under Time-varying Unsteady Conditions (Outstanding Thesis, Top 5%)	Xi'an, Shaanxi, China Sep 2021 - Jun 2024	
	Xi'an Jiaotong University (XJTU) <i>B.Eng in Mechanical Engineering</i> <i>B.Eng in Computer Science and Technology</i>	Xi'an, Shaanxi, China Aug 2017 - Jun 2021 May 2019 - Jun 2021	
PUBLICATIONS	JOURNAL PUBLICATIONS (* equal contribution) [J5] X. Liu* , X. Song*, Y. Sulub, D. Zoller, Z. Kong, B. Johnson. "Classification of Recycled Plastics using Sparse and Imbalanced Spectral Data and Data Augmentation by the Generative Adversarial Network" <i>Analyst</i> , March, 2026. (Working paper with SABIC) [J4] X. Liu , J. Chen, J. Xie, Y. Chang. "Generating HSR Bogie Vibration Signals via Pulse Voltage-Guided Conditional Diffusion Model". <i>IEEE Transactions on Intelligent Transportation Systems</i> , November 2024. [J3] Z. Li*, X. Liu* , K. Zhang, C. Li, J. Chen. "Intelligent Fault Diagnosis under Imbalanced Multivariate Working Conditions Leveraging Dynamic Unsupervised Domain Adaptation with Sample and Margin Regularization". <i>Measurement Science and Technology</i> , April, 2024. [J2] X. Liu , J. Chen, K. Zhang, S. Liu, S. He, Z. Zhou. "Cross-domain intelligent bearing fault diagnosis under class imbalanced samples via transfer residual network augmented with explicit weight self-assignment strategy based on meta data". <i>Knowledge-Based Systems</i> , June 2022. [J1] Z. Shi, X. Liu , J. Chen, Y. Zi, Z. Zhou. "A multi-branch redundant adversarial net for intelligent fault diagnosis of multiple components under drastically variable speeds". <i>ISA transactions</i> , Jan 2022.		
CONFERENCE PRESENTATIONS	IISE Annual Conference & Expo "Safe Reinforcement Learning-Driven Path Planning for Improved Thermal Uniformity in Wire-Arc Additive Manufacturing"	Arlington, TX	May 2026
	INFORMS Annual Meeting "Generalizable Thermal Field Prediction for Moving Heat Source Trajectories via Heat Source-Aware Fourier Neural Operators"	San Francisco, CA	Nov 2026
WORKING EXPERIENCE	SMART Lab, Virginia Tech <i>Graduate Research Assistant, Advisor: Prof. Zhenyu (James) Kong</i> - Conduct research on machine learning methods for cyber-physical manufacturing systems State Key Laboratory for Manufacturing Systems Engineering, XJTU <i>Graduate Research Assistant, Advisor: Prof. Jinglong Chen</i> - Explore solutions to adapting diagnostic models in unlabeled and imbalanced scenarios across various operational conditions - Publish 4 research papers related to machines fault diagnosis	Blacksburg, VA, USA Sep 2024 - Present	Xi'an, Shaanxi, China Sep 2020 - Jun 2024

TEACHING EXPERIENCE	Graduate Teaching Assistant	
	<i>ISE 4424, Logistics Engineering, Virginia Tech</i>	Jan 2026 - May 2026
	<i>ISE 3214, Facility Planning and Material Handling, Virginia Tech</i>	Aug 2025 - Dec 2025
	<i>ISE 4304, Global Issues in Industrial Managment, Virginia Tech</i>	Jan 2025 - May 2025
	<i>ISE 4004, Theory of Organization, Virginia Tech</i>	Aug 2024 - Dec 2024
	<i>Modern Signal Processing Techniques and Its Applications, XJTU</i>	Sep 2023 - Jan 2024
PROJECTS AND COMPETITIONS	Low-Cost Remote Control Servo Quadruped Robot	Nov 2020 - Jan 2021
	<i>Product Design and Development Course</i> , advised by Prof. Dun Lv	
	• Deploy an eight-servo quadrupedal gait with pitch control • Implement a bluetooth-enabled remote control system with a corresponding mobile application • Mechanism design (via Solidworks) and fabrication (via 3D print)	
	Indoor Assistive Robot for Elderly People	Aug 2019 - Nov 2020
	<i>Leader, Mechanism Design</i> , advised by Sr. Eng. Liang Gui	
	• National 1st Prize in National College Student Mechanical Design Innovation Competition • Design a biomimetic flexible protection mechanism that adapts to fit the human back for protection • Design a lifting mechanism(via Solidworks) suitable for the natural curvature of human body and Check mechanical strength(via Ansys)	
	RoboCon China College Robot Competition	Sep 2018 - Jun 2019
	<i>Mechanism Design</i> , advised by Prof. Jun Xu	
	• National 1st Prize of RoboCon China College Robot Competition • Design and fabricate two competition-ready robots (Including wheeled mobility, obstacle navigation, and projectile tasks, achieving all tasks under 1 min) • Mechanism design(via Solidworks, AutoCad) and fabrication (via 3D print, CNC)	
HONORS AND AWARDS	Graduate Fellowship, Grado Department of Industrial & Systems Engineering	2024
	QU&HE Fault Diagnosis Scholarship	2021
	Outstanding Graduate Student, Xi'an Jiaotong University	2021
	SMC Scholarships	2019
	School Scholarships, Xi'an Jiaotong University	2018, 2020, 2022, 2023
	Merit Student, Xi'an Jiaotong University	2018, 2020
SERVICE	Journal Reviewer for:	
	• <i>IEEE Transactions on Intelligent Transportation Systems</i>	
	• <i>Knowledge-Based Systems</i>	
	• <i>Measurement Science and Technology</i>	
	• <i>ISA Transactions</i>	
	• <i>Machine Learning: Engineering</i>	
SKILLS	Programming	Python (PyTorch), MATLAB, $\LaTeX$, C/C++, Linux (Ubuntu), R
	Mechanical Design	SolidWorks, AutoCAD, Inventor, ANSYS
	Languages	Mandarin (Native), English (Fluent)