

Dr Zhenyu Lu (BEng, MEng, PhD)

I am a professor at the South China University of Technology in Guangzhou and was a permanent Senior Research Fellow at the Bristol Robotics Laboratory, University of the West of England Bristol during 2023 to 2025 in the UK. My research interests focus on embodied intelligence and dexterous robotic manipulation in complex environments, with particular interests in embodied AI, soft robotic end-effector design, visuo-tactile sensor, robot learning and control, and teleoperation.

Contact details

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Education History

- 03/2013 ~ 03/2019** Ph.D. in Robotics , Northwestern Polytechnical University, China;
- 09/2010 ~ 12/2012** MSc in Automation and Control, Shenyang Aerospace University, China
- 09/2006 ~ 07/2010** Master in Electrical and Electronic Engineering, China University of Mining and Technology, China;
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Work Experience

- 4/2025~ present** Professor of Robotics, School of Automation Science and Engineering, South China University of Technology
- 1/2023 ~ 1/2025** Permanent Senior Research Fellow, Bristol Robotics Laboratory, University of the West of England, Bristol, UK;
- 07/2021 ~ 12/2022** Senior Research Fellow , Marie Skłodowska-Curie Individual Research Fellow, Bristol Robotics Laboratory, Bristol, UK;
- 12/2019 ~ 06/2021** Postdoctoral Research Associate, Bristol Robotics Laboratory, Bristol, UK;
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Awards

- 2026** Best application paper finalist of YAC 2026
- 2025** Best paper award finalist of ICRA 2025, USA; Best poster award of IROS 2025, China; Best application paper award of ICAC 2025;
- 2024** Best poster of ICRA 2024 Vitac workshop, Japan; ICIRA 2024 Best paper award, Xian, Shannxi China;
- 2023** VC ECR Development Award 2023-25, University of the West of England, Bristol, UK;
- 2022** Best poster paper of the 9th annual conference of the Marie Curie Alumni Association, on 26-27, European Commission;
- 2021** Finalist of the EPSRC Postdoctoral Fellowship, UKRI, UK;
- 2021** Marie Skłodowska-Curie Research Fellowship, European Commission;
- 2020** Winner team (1st) in Agri-EPI Hackathon, UK;
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Membership of Academic Societies:

- IEEE Senior Member ;
 - IEEE Robotics and Automation Society Member;
 - Member of Robotics Committee, Association of Automation of China
 - Member of Youth Working Committee, Association of Automation of China
 - Member of Intelligent Robot Committee, China Computer Federation
 - Member of Marie Curie Alumni Association, European Commission;
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Organization of Conference and Special Issues:

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| 2026 | Guest Editor, Special issue in Robot Learning: Learning-Based Motion Planning and Control for Contact-Rich Legged Robots, Organizing Committee Co-Chairs; Session chair, 2026 International Conference on Automation-Intelligence-Safety & International Symposium on Autonomous Systems ; Youth Advisory Council (YAC)2026; Workshop on Sensorimotor-Augmented Interaction: Human-Interaction-Oriented Paradigms and Real-World Concerns at IROS 2026 |
| 2025 | Guest Editor, Special issue in Sensors: Advanced Tactile Sensors: Design and Applications; Session chair, International Conference on Automation and Computing 2025; |
| 2024 | Organizing Committee Co-Chairs, Session chair, 25th IEEE International Conference on Industrial Technology; |
| 2023 | Guest Editor, Special issue in Frontiers in Neurorobotics: Sensing and Control for Efficient Human-Robot Collaboration; |
| 2022 | Local committee & Session Chair, IEEE International Conference on Automation & Computing (ICAC); |
| 2021 | Guest editor, Special Issue in Actuators: Advanced Technologies and Applications in Robotics; Special Issue in Complexity: Unmanned Autonomous Systems in Complex Environments (UASCE 2021); |
| 2015 | Session chair, IEEE International Conference on Information & Automation (ICIA); |
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Research Grants:

Research grants as a PI:

- National Natural Science Foundation of China (NSFC), General Program, 2027 – 2031;
- National Natural Science Foundation of China (NSFC), Excellent Young Scientists Fund (Overseas), 2025 – 2028;
- Guangdong Provincial Key R&D Program (Project Leader), 2025 – 2028;
- Shanxi Provincial Regional Cooperation Project, 2026 – 2029;
- Fundamental Research Funds for the Central Universities, General Program, 2025 – 2026; The Royal Society, Standard Research Grant, 2024 – 2025;
- Vice Chancellor's Early Career Researcher (VC ECR) award. Funder: University of the West of England Bristol. 2023 - 2025;

Research grants as a Senior Research Fellow (SRF) or Research Associate (RA):

- Marie Skłodowska-Curie Research Fellowship (SRF): Learn to learn human learning process from teleoperated demonstrations. 2021 –2022;
 - EPSRC Innovation Fellowship (RA): Human Centred Robotics for Next-generation Flexible Manufacturing, 2018 –2021;
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Publications:

Journal papers:

2026:

1. Zhenyu Lu, Lu Chen, Yanpeng Guan, Jing Luo, Chao Zeng, "Advanced sensing, learning and control for effective human-robot interaction", *Frontiers in Robotics and AI*, 13: 1928993, 2026.
2. Peng Zhou, Jun Hu, Sihan Chen, Zeqing Zhang, Haofei Ma, Zhenyu Lu, Sichao Liu, Xueqian Wang, Pai Zheng, Xiang Li, "Vision-Based Tactile Intelligence for Robotics: Sensing, Learning, and Embodied Manipulation", *arXiv preprint arXiv:2608.15490*, 2026.
3. Lu Chen, Zhuomao Li, Zhou Zhao, Zhenyu Lu*, Huaiyao Wang, Chenguang Yang, "Efficient Visual Manipulation Relationship Reasoning with Relationship Attention and Sparse Graph in Robotic Grasping", *IEEE Transactions on Automation Science and Engineering*, 2026. In press.
4. Kunlin Guo, Zhenyu Lu*, Zhiwei Tan, "Adaptive Stiffness Control for Series Elastic Actuators in Robotic Systems Using Dynamic Systems", *Computational Intelligence, Computational Intelligence* 42, no. 1 (2026): e70163.
5. Jialong Yang, Zhenyu Lu*, Chao Zeng, Fan Zhang, Chenguang Yang*, "TacShade 2.0: A New Greyscale Pattern-Based Optical Tactile Sensor for Robotic Perception and Adaptive Admittance Control", *IEEE Transactions on Instrumentation and Measurement*, vol. 75, pp. 1-13, 2026, Art no. 9505813.

2025:

1. Chengguo Liu, Kai Zhao, Zhenyu Lu, Chaoyang Li, "Observer-Based Fuzzy Adaptive Admittance Control for Unknown Environment-Coupled Physical Human-Robot Interaction With Prescribed Tracking", *IEEE Transactions on Fuzzy Systems*, vol. 34, no. 2, pp. 638-649, 2025.
2. Longnan Li, Lanyong Zhang, Zhenyu Lu, Chenguang Yang, "Neuro-Observer Based Adaptive Fixed-Time Fault-Tolerant Control for Uncertain Teleoperation System With Input Saturation and Asymmetric Time-Varying Output Constraints", *International Journal of Robust Nonlinear Control*, 35: 4536-4553.
3. Lu Chen, Zhuomao Li, Jing Yang, Zhenyu Lu*, Peng Wu, Tianhua Chen, "Grasp Representation and Detection with Consistent Path in Robotic Grasping", *IEEE Transactions on Cognitive and Developmental Systems*, 2025. In press.
4. Longnan Li, Lanyong Zhang, Zhenyu Lu, Panfeng Huang, Chenguang Yang "Admittance-Based Adaptive Predefined-Time Fault-Tolerant Control for Physical Human-Robot Interaction With Prescribed Tracking", *IEEE Transactions on Industrial Electronics*, 2025. In press.
5. Tianqi Yue, Chenghua Lu, Kailuan Tang, Qiukai Qi, Zhenyu Lu, Loong Yi Lee, Hermes Bloomfield-Gadêlha, Jonathan Rossiter, "Embodying soft robots with octopus-inspired hierarchical suction intelligence", *Science Robotics*, Vol. 10, No.102, 2025.

6. Donghao Shi, Sihan Jin, Chenguang Yang, Zhenyu Lu, Qinchuan Li, "Exploring the Synergistic Effects of Teleoperation Scaling Ratio and Learning from Demonstration", Vol. 22, 2025, pp. 15106 – 15115.

2024:

1. Lu Chen, Zhuomao Li, Zhenyu Lu, Yuwei Wang, Hong Nie, Chenguang Yang, "Domain-Invariant Feature Learning via Margin and Structure Priors for Robotic Grasping", IEEE Robotics and Automation Letters, Vol. 10, No. 2, 2024.
2. Donghao Shi, Hao Hu, Chenguang Yang, Zhenyu Lu, Qinchuan Li, "A Learning System for Deformable Object Cooperative Manipulation", IEEE Transactions on Automation Science and Engineering, Vol. 22, 2024.
3. Hong Nie, Zhou Zhao, Lu Chen, Zhenyu Lu, Zhuomao Li, Jing Yang, "Smaller and faster robotic grasp detection model via knowledge distillation and unequal feature encoding", Vol. 9, No. 8, 2024.
4. Zhenyu Lu, Weiyong Si, Ning Wang, Chenguang Yang, "Dynamic movement primitives-based human action prediction and shared control for bilateral robot teleoperation", IEEE Transactions on Industrial Electronics, Vol. 71, No. 12, 2024.
5. Zhenyu Lu, Ning Wang, Chenguang Yang, "A Dynamic Movement Primitives-Based Tool Use Skill Learning and Transfer Framework for Robot Manipulation", IEEE Transactions on Automation Science and Engineering, 2024, In press.
6. Zhou Zhao, Wenhao He, Zhenyu Lu*, "Tactile-based Grasping Stability Prediction based on Human Grasp Demonstration for Robot Manipulation", IEEE Robotics and Automation Letters, 2024, In press.
7. Haoran Li, Saekwang Nam, Zhenyu Lu, Chenguang Yang, Efi Psomopoulou, Nathan F Lepora, "BioTacTip: A Soft Biomimetic Optical Tactile Sensor for Efficient 3D Contact Localization and 3D Force Estimation", IEEE Robotics and Automation Letters, 2024, In press.

2023:

1. Zhenyu Lu, Ning Wang, Weiyong Si, Chenguang Yang. "Distributed observer-based prescribed performance control for multi-robot deformable object cooperative teleoperation", IEEE Transactions on Automation Science and Engineering, 2023.
2. Zhenyu Lu, Zhao Zhou, Tianqi Yue, Xu Zhu, Ning Wang, "A Bio-inspired Multi-functional Tendon-driven Tactile Sensor and Application in Obstacle Avoidance Using Reinforcement Learning", IEEE Transactions on Cognitive and Developmental Systems, vol. 16, no. 2, 2023: 407-415.
3. Zhenyu Lu, Lu Chen, Hengtai Dai, Haoran Li, Zhou Zhao, Bofang Zheng, Nathan F. Lepora, Chenguang Yang, "Visual-Tactile Robot Grasping based on Human Skill Learning from Demonstrations using A Wearable Parallel Hand Exoskeleton", IEEE Robotics and Automation Letters, vol. 8, no. 9, 2023: 5384 - 5391.
4. Zhenyu Lu, Ning Wang, Qinchuan Li, Chenguang Yang, "A trajectory and force dual-incremental robot skill learning and generalization framework using improved dynamical movement primitives and adaptive neural network control", Neurocomputing, vol. 521, 2023: 146- 159.
5. Mingdi Niu[#], Zhenyu Lu[#], Lu Chen, Jing Yang, Chenguang Yang, "VERGNet: Visual Enhancement Guided Robotic Grasp Detection under Low-light Condition", IEEE Robotics and Automation Letters, vol. 8, no. 2, 2023: 8541 – 8548.
6. Hengtai Dai, Zhenyu Lu*, Mengyuan He, Chenguang Yang, "A gripper-like exoskeleton design for robot grasping demonstration", Actuators, vol. 12, no. 1, 2023: 39.

7. Shiou Wang, Zhengxiong Liu, Zhiqiang Ma, Haitao Chang, Panfeng Huang, Zhenyu Lu, "A closed-form solution for inverse kinematics of redundant space manipulator with multiple joint offsets", *Advances in space research*, vol. 8, no. 2, 2023: 1844-1860.
8. Donghao Shi, Qinchuan Li, Chenguang Yang, Zhenyu Lu, "A constrained framework based on IBLF for robot learning with human supervision", *Robotica*, vol. 41, no. 8, 2023: 2451-2463.
9. Xianfa Xue, Jiale Dong, Zhenyu Lu, Ning Wang, "A robotic learning and generalization framework for curved surface based on modified DMP", *Robotics and Autonomous Systems*, vol. 160, 2023: 104323.

2022:

1. Zhenyu Lu, Ning Wang, "Biomimetic Force and Impedance Adaptation Based on Broad Learning System in Stable and Unstable Tasks: Creating an Incremental and Explainable Neural Network With Functional Linkage", *IEEE Robotics & Automation Magazine*, vol. 29, no. 4, 2022: 66-77.
2. Zhenyu Lu, Ning Wang, Donghao Shi, "DMPs-based skill learning for redundant dual-arm robotic synchronized cooperative manipulation", *Complex & Intelligent Systems*, vol. 8, no. 4, 2022: 2873-2882.
3. Zhenyu Lu, Yuan Guan, Ning Wang, "An Adaptive Fuzzy Control for Human-in-the-Loop Operations With Varying Communication Time Delays", *IEEE Robotics and Automation Letters*, vol. 7, no. 2, 2022: 5599-5606.
4. Zhenyu Lu, Ning Wang, Chenguang Yang, "A novel iterative identification based on the optimised topology for common state monitoring in wireless sensor networks", *International Journal of Systems Science*, vol. 53, no. 1, 2022: 25-39.
5. Xiyao Liu, Haitao Chang, Panfeng Huang, Zhenyu Lu, "Robust Output-Feedback Predictive Control for Proximity Eddy Current Detumbling With Constraints and Uncertainty", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 59, no. 2, 2022: 858-870.

2021:

1. Zhenyu Lu, Ning Wang, Chenguang Yang, "A constrained DMPs framework for robot skills learning and generalization from human demonstrations", *IEEE/ASME Transactions on Mechatronics*, vol. 26, no. 6, 2021: 3265-3275.
2. Zhenyu Lu, Ning Wang, Miao Li, Chenguang Yang, "Incremental Motor Skill Learning and Generalization from Human Dynamic Reactions based on Dynamic Movement Primitives and Fuzzy Logic System", *IEEE Transactions on Fuzzy Systems*, vol. 30, no. 6, 2021: 1506-1515.
3. Zhenyu Lu, Ning Wang, Chenguang Yang, "A novel iterative identification based on the optimised topology for common state monitoring in wireless sensor networks", *International Journal of Systems Science*, vol. 53, no. 1, 2021: 25-39.

2020 and before:

1. Zhenyu Lu, Panfeng Huang, Zhengxiong Liu, "Relative impedance-based internal force control for bimanual robot teleoperation with varying time delay", *IEEE Transactions on Industrial Electronics*, vol. 67, no. 1, 2019: 778-789.
2. Zhenyu Lu, Panfeng Huang, Zhengxiong Liu, Haifei Chen, "Fuzzy-observer-based hybrid force/position control design for a multiple-sampling-rate bimanual teleoperation system", *IEEE Transactions on Fuzzy Systems*, vol. 27, no. 7, 2018: 1383-1396.
3. Zhenyu Lu, Panfeng Huang, Zhengxiong Liu, "Predictive approach for sensorless bimanual teleoperation under random time delays with adaptive fuzzy control", *IEEE Transactions on Industrial Electronics*, vol. 65, no. 3, 2017: 2439-2448.

4. Zhenyu Lu, Panfeng Huang, Pei Dai, Zhengxiong Liu, Zhongjie Meng, "Enhanced transparency dual-user shared control teleoperation architecture with multiple adaptive dominance factors ", International Journal of Control, Automation and Systems, vol. 15, no. 5, 2017: 2301-2312.
5. Zhenyu Lu, Miao Li, Andy Annamalai, Chenguang Yang, "Recent advances in robot - assisted echography: combining perception, control and cognition", Cognitive Computation & Systems, vol. 2, no. 3, 2020: 85-92.
6. Zhenyu Lu, Panfeng Huang, Zhengxiong Liu, "High - gain nonlinear observer - based impedance control for deformable object cooperative teleoperation with nonlinear contact model", International Journal of Robust and Nonlinear Control, vol. 30, no. 4, 2020: 1329-1350.
7. Zhenyu Lu, Panfeng Huang, Ruizhou Cheng, Zhengxiong Liu, Zhongjie Meng, "Adaptive robust control for bimanual cooperative contact teleoperation with relative jacobian matrix", Journal of Intelligent & Robotic Systems, vol. 95, 2019: 47-60.
8. Zhengxiong Liu, Zhenyu Lu, Yang Yang, Panfeng Huang, "Teleoperation for space manipulator based on complex virtual fixtures", Robotics and Autonomous Systems, vol.121, 2019: 103268.
9. Panfeng Huang, Pei Dai, Zhenyu Lu, Zhengxiong Liu, "Asymmetric wave variable compensation method in dual-master-dual-slave multilateral teleoperation system", Mechatronics, vol. 49, 2018: 1-10.
10. Haitao Chang, Panfeng Huang, Zhenyu Lu, Yizhai Zhang, Zhongjie Meng, Zhengxiong Liu, "Inertia parameters identification for cellular space robot through interaction", Aerospace Science and Technology, vol. 71, 2017: 464-474.
11. Zhou Zhao, Panfeng Huang, Zhenyu Lu, Zhengxiong Liu, "Augmented reality for enhancing tele-robotic system with force feedback", Robotics and Autonomous Systems, vol. 96, 2017: 93-101.
12. Panfeng Huang, Zhenyu Lu, Zhengxiong Liu, "State estimation and parameter identification method for dual-rate system based on improved Kalman prediction", International Journal of Control, Automation and Systems, vol. 14, no. 4, 2016: 998-1004.
13. Zhengxiong Liu, Panfeng Huang, Zhenyu Lu, "Recursive differential evolution algorithm for inertia parameter identification of space manipulator", International Journal of Advanced Robotic Systems, vol. 13, no. 3, 2016: 104.

Conference papers (after 2022):

1. Chenglin Li, Xiwen Luo, Zhenyu Lu, Chenguang Yang, CL Philip Chen, Jiehao Li," Toward Farmland Mapping and Growth Monitoring via Multi-Robot System for Agricultural Applications", 2026 41st Youth Academic Annual Conference of Chinese Association of Automation (YAC), pp. 1622-1627, 2026.
2. Wenrui Gou, Siyuan Ye, Zhen Zhan, Yijiong Lin, Gan Sun, Zhenyu Lu," A Biomimetic Tactile Sensor System with Deep Learning for Needle Tip Position Prediction in Robotic Surgical Steering", 2026 41st Youth Academic Annual Conference of Chinese Association of Automation (YAC), pp. 2212-2217, 2026.
3. Xiaolong Li, Tunwu Li, Zhenyu Lu, Chao Zeng, Guangliang Cheng, Chenguang Yang," A Multi-Task Learning System for Composites Defect Segmentation and Classification with TacRoller", IEEE IROS 2026, Oral presentation.
4. Yuxiang Feng, Yixuan Jin, Mingxu Chen, Jialong Yang, Guanqun Cao, Chenguang Yang, Zhenyu Lu "Wireless Tactile Sensor with Embedded Neural Network for Multifunctional Contact Detection", IEEE ICAC 2025, Oral presentation.

5. Yuxiang Feng, Xiaolong Li, Tunwu Li, Zelin Cai, Zhenyu Lu, Chenguang Yang," Optical Flow-Based Depth Prediction and Defect Detection Using TacRoller with MOGA-Enhanced U-Net", IEEE ICIEA 2025, Oral presentation.
6. Zhenyu Lu, Jialong Yang, Haoran Li, Yifan Li, Weiyong Si, Nathan Lepora, Chenguang Yang, "TacShade: A New 3D-Printed Soft Optical Tactile Sensor Based on Light, Shadow and Grey Scale for Shape Reconstruction", IEEE ICRA 2024, Oral presentation.
7. Zhenyu Lu, Xiaolong Li, Tunwu Li, Xiaodong Xu, Chenguang Yang, An Innovative Tactile Sensor Roller for Composites Inspection, IEEE ICIT 2024, Oral presentation.
8. Zhenyu Lu, Ning Wang, "Biomimetic Force and Impedance Adaptation Based on Broad Learning System in Stable and Unstable Tasks: Creating an Incremental and Explainable Neural Network With Functional Linkage", IEEE ICRA 2023, Oral presentation.
9. Zhenyu Lu, Tianqi Yue, Zhou Zhao, Weiyong Si, Ning Wang, Chenguang Yang, "MechTac: A Multifunctional Tendon-Linked Optical Tactile Sensor for In/Out-the-Field-of-View Perception with Deep Learning", IECON 2023, Oral presentation.
10. Hengtai Dai, Zhenyu Lu, Chenguang Yang, Shangbin Dai, "A 3-DOF Haptic Feedback System for Displaying Sliding and Torsion Effects Detected by TacTip Sensor", IEEE ICAC 2023, Oral presentation.
11. Lingzi Xie, Darong Huang, Zhenyu Lu, Ning Wang, Chenguang Yang, "Handheld device design for robotic teleoperation based on multi-sensor fusion", ICM 2023, Oral presentation.
12. Zhenyu Lu, Ning Wang, Miao Li, Chenguang Yang, "A novel dynamic movement primitives -based skill learning and transfer framework for multi-tool use", IEEE ICCA 2022, Oral presentation.
13. Zhou Zhao, and Zhenyu Lu, "Multi-purpose Tactile Perception Based on Deep Learning in a New Tendon-driven Optical Tactile Sensor." IEEE IROS 2022, Oral presentation.
14. Haitao Chang, Xiyao Liu, Tong Wang, Zhenyu Lu, "Distributed impedance control for cellular space robot in spacecraft takeover control", IEEE IECON 2022, Oral presentation.
15. Bixiao Wu, Zhenyu Lu, Chenguang Yang, "A modified LSTM model for chinese sign language recognition using leap motion", IEEE SMC 2022, Oral presentation.
16. Haiqi Huang, Zhenyu Lu, Ning Wang, Chenguang Yang, "Fixed-time Adaptive Neural Control for Robot Manipulators with Input Saturation and Disturbance", IEEE ICAC 2022, Oral presentation.
17. Hengtai Dai, Zhenyu Lu, Mengyuan He, Chenguang Yang, "Novel gripper-like exoskeleton design for robotic grasping based on learning from demonstration", IEEE ICAC 2022, Oral presentation.