

研究成果

審稿中論文

1. W. Zhang, Q. Zhang, M. Xu, M. You, H. Shen, Z. He, K. Jin, D.F. Wong, T. Fang, "Agri-CPJ: A training-free explainable framework for agricultural pest diagnosis using caption-prompt-judge and LLM-as-a-judge", *Expert Systems with Applications*, Under Review (Paper ID: ESWA-D-26-15157), 2026.
2. H.H. Shen*, Z.H. Tan, "Safe Switching for AI Customer Service via Lyapunov-Certified Residual Emotion Dynamics", *The IFAC World Congress*, Under Review (Paper ID: 2384), 2026.
3. H.H. Shen*, Z.H. Tan, Y.J. Pan, "Lyapunov-Based Stability and Region-of-Attraction Analysis of a Multistable Neural Mass Model", *The 2026 International Symposium on Industrial Electronics (ISIE)*, Under Review (Paper ID: 000186), June 2025.
4. H.H. Shen*, Z.H. Tan, "TA-GAN: A LiDAR-Based Trajectory Prediction Framework for Dynamic Obstacles in Indoor Robot Navigation", *Robotics and Autonomous Systems*, Under Review (Paper ID: ROBOT-D-26-00591), 2026.
5. H.H. Shen, W.F. Xie, "Path Planning for Robot Manipulator Using Adaptive Reinforcement Learning", *Neurocomputing*, Under Review (Paper ID: NEUCOM-D-23-07231), 2025.

期刊論文發表

1. Z.H. Tan, H.H. Shen*, Y.Y. Wu, "RoboNavGuard: Lightweight Deformable Obstacle Segmentation and 3D Visual Grounding for Indoor Robot Navigation", *Machine Vision and Applications*, Accepted, 2026. (JCR Q2)
2. Z.H. Tan, H.H. Shen, "Lyapunov-based emotion-aware switching in hybrid human artificial intelligence customer service systems*", *Information Sciences*, Accepted, 2026. (JCR Q1, TOP 期刊)
3. R. Chen*, J. Xie, Y. Liu, H. Chen, S. Tang, J. Cheng, H.H. Shen, Z. Tan, "A novel complex network framework: Multi-span transition network with Riemann similarity measure", *Engineering Applications of Artificial Intelligence*, Accepted, 2025. (JCR Q1, TOP 期刊)
4. H.H. Shen, Wen-Fang Xie*, Ningyu Zhu, "Degeneracy-Aware Full-Pose Path Planning Strategy for Robot Manipulator", *IEEE Transactions on Systems, Man and Cybernetics: Systems*, Vol. 54, No. 8, pp. 4955-4965, 2024. (JCR Q1, TOP 期刊, IF: 8.6)
5. N.Y. Zhu, W.F. Xie*, H.H. Shen, "Trajectory planning of cooperative robotic system for automated fiber placement in a leader-follower formation", *The International Journal of Advanced Manufacturing Technology*, Vol. 130, No. 1-2, pp. 575-588, 2024. (JCR Q1, IF: 2.9)
6. H.H. Shen, Wen-Fang Xie*, Jianyu Tang, Tao Zhou, "Adaptive Manipulability-Based

- Path Planning Strategy for Industrial Robot Manipulators*", *IEEE/ASME Transactions on Mechatronics*, Vol. 28, No. 3, pp. 1742-1753, 2023. (JCR Q1, TOP 期刊, IF: 6.1)
7. H.H. Shen, Y.J. Pan, "Nonlinear State Estimation and Online Neighbor Selection for Multi-Manipulator Systems*", *IEEE/ASME Transactions on Mechatronics*, Vol. 27, No. 6, pp. 4373-4383, 2022. (JCR Q1, TOP 期刊, IF: 6.1)
 8. L. Wan, Y.J. Pan*, H.H. Shen, "Improving Synchronization Performance of Multiple Euler-Lagrange Systems using Non-Singular Terminal Sliding Mode Control with Fuzzy Logic", *IEEE/ASME Transactions on Mechatronics*, Vol. 27, No. 4, pp. 2312-2321, 2022. (JCR Q1, TOP 期刊, IF: 6.1)
 9. H.H. Shen, Y.J. Pan, "Tracking Synchronization Improvement of Networked Manipulators Using Novel Adaptive Non-Singular Terminal Sliding Mode Control*", *IEEE Transactions on Industrial Electronics*, Vol. 68, No. 5, pp. 4279-4287, 2021. (JCR Q1, TOP 期刊, IF: 7.5)
 10. U. Ahmad, Y.J. Pan*, H.H. Shen, "Robust Control Design for Teleoperation of Multiple Mobile Manipulators under Time Delays", *International Journal of Robust and Nonlinear Control*, Vol. 30, No. 16, pp. 6454-6472, 2020. (JCR Q1, IF: 3.2)
 11. H.H. Shen, Y.J. Pan*, U. Ahmad, B.W. He, "Pose Synchronization of Multiple Networked Manipulators using Non-singular Terminal Sliding Mode Control", *IEEE/ASME Transactions on Systems, Man and Cybernetics: Systems*, Vol. 51, No. 12, pp. 7497-7509, 2020. (JCR Q1, TOP 期刊, IF: 8.6)
 12. H.H. Shen, Y.J. Pan, "Improving Tracking Performance of Nonlinear Uncertain Bilateral Teleoperation Systems with Time-Varying Delays and Disturbances*", *IEEE/ASME Transactions on Mechatronics*, Vol. 25, No. 3, pp. 1171-1181, 2020. (JCR Q1, TOP 期刊, IF: 6.1)
 13. Y.Q. Liu, S.Y. Huang, B. He*, L.G. Yao, A. Lv, H.H. Shen, M.W. Chen, W.Y. Hong, "Preliminary Application of 3D Printing Technology in the Surgical Treatment of Falx Meningioma", *Chinese General Practice*, Vol. 19, No. 24, pp. 2953-2956, 2016. (JCR Q3, IF: 3.44)
 14. H.H. Shen, B. He*, J. Zhang, S. Chen, "Obtaining four-dimensional vibration information for vibrating surfaces with a Kinect sensor", *Measurement*, Vol. 65, pp. 149-165, 2015. (JCR Q1, IF: 5.2)
 15. L. Huang, C. Chen, H.H. Shen, B. He, "Adaptive registration algorithm of color images based on SURF*", *Measurement*, Vol. 66, pp. 118-124, 2015. (JCR Q1, IF: 5.2)
 16. S.S. Dong, B. He*, C. Lin, Q. Zhao, H.H. Shen, "Calibration method for a structured light measurement system with two different focal length cameras", *Measurement*, Vol. 73, pp. 462-472, 2015. (JCR Q1, IF: 5.2)
 17. X. Zhou*, H.H. Shen, B. He, "Birth Intensity Estimation Method for Multi-target Video Tracking", *Journal of Computer Aided Design & Computer Graphics*, Vol. 26,

會議論文發表

1. S.Y. Zhang, H.Y. Song, Q.X. Wang*, H.H. Shen, Y. Pei, "*A Test Oracle for Reinforcement Learning Software Based on Lyapunov Stability Control Theory*", in **Proceedings of the IEEE/ACM 47th International Conference on Software Engineering (ICSE 2025)**, April 27-May 3, 2025, Ottawa, Canada, pp. 502-513. (軟件工程領域頂級會議, Distinguished Paper Award)
2. N.Y. Zhu, W.F. Xie*, H.H. Shen, "*A Leader-Follower Trajectory Planning Approach for Cooperative Robotic System in Automated Fiber Placement*", in *Proceedings of 2023 IEEE International Conference on Mechatronics and Automation (IEEE ICMA 2023)*, IEEE, 2023.
3. N.Y. Zhu, W.F. Xie*, H.H. Shen, "*Adaptive Sliding Mode Control with RBF Neural Network-Based Tuning Method for Parallel Robot*", in *Proceedings of the 48th Annual Conference of the IEEE Industrial Electronics Society (IECON 2022)*, IEEE, 2022.
4. R. Adderson, Y.J. Pan*, H.H. Shen, "*Application of Sliding Mode Control for the Formation of Heterogeneous Multi-Agent Systems*", in *Proceedings of the 5th IEEE Conference on Control Technology and Applications (CCTA)*, August 9-11, 2021, San Diego, USA, pp. 777-782. (控制領域頂級會議)
5. H.H. Shen, Y.J. Pan*, L. Wan, "*Teleoperated Single-Master-Multiple-Slave System for Cooperative Manipulations in Task Space*", in **Proceedings of the IEEE International Conference on Industrial Cyber-Physical Systems (ICPS 2021)**, May 2021, Victoria, BC, Canada, pp. 864-869. (Best Presentation Award)
6. H.H. Shen, Y.J. Pan*, G. Bauer, "*Online Noise-Estimation-based Neighbor Selection for Multi-Manipulator Systems*", in **Proceedings of the 21st IFAC World Congress (IFAC-WC)**, July 2020, Berlin, Germany, Vol. 53, No. 2, pp. 9802-9807. (控制領域頂級會議)
7. G. Bauer, Y.J. Pan, H.H. Shen, "*Adaptive Impedance Control in Bilateral Telerehabilitation with Robotic Exoskeletons*", in *Proceedings of the 2020 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2020)*, October 2020, Toronto, Canada, pp. 719-725.
8. H.H. Shen, Y.J. Pan, "*Adaptive Robust Control of Networked Multi-Manipulators with Time-Varying Delays**", in *Proceedings of the 2019 IEEE American Control Conference (ACC)*, July 2019, Philadelphia, USA, pp. 3670-3675. (控制領域頂級會議)
9. H.H. Shen, Y.J. Pan*, U. Ahmad, S. Liu, M. Wu, Y. He, "*Tracking Performance Evaluations on the Robust Teleoperative Control of Multiple Manipulators*", in **Proceedings of the 28th IEEE International Symposium on Industrial Electronics (IEEE-ISIE 2019)**, June 2019, Vancouver, Canada, pp. 1268-1273.
10. H.H. Shen, Y.J. Pan*, G. Bauer, "*Manipulability-based Load Application and*

Kinematic Decoupling in Cooperative Manipulations", in *Proceedings of the 28th IEEE International Symposium on Industrial Electronics (IEEE-ISIE 2019)*, June 2019, Vancouver, Canada, pp. 1168-1173.

11. U. Ahmad, Y.J. Pan*, H.H. Shen, S. Liu, "*Cooperative Control of Mobile Manipulators Transporting an Object based on an Adaptive Backstepping Approach*", in *Proceedings of the 14th IEEE International Conference on Control and Automation (ICCA)*, June 2018, Anchorage, Alaska, USA, pp. 198-203.
12. H.H. Shen, Y.J. Pan*, B. He, "*Teleoperation of Multiple Cooperative Slave Manipulators Using Graph-based Non-singular Terminal Sliding-Mode Control*", in *Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO)*, December 2017, Macau, China, pp. 1430-1435. (機器人領域頂級會議)
13. H.H. Shen, A.T. Lei, B. He, "*Fusing Salient Region Features and Depth Data for Real-time Multi-target Searching and Humanoid Navigation**", in *Proceedings of the 1st IEEE International Conference on Real-time Computing and Robotics (RCAR 2015)*, June 2015, Changsha, China.

主持或參加的科研項目

澳珠琴跨境低空無人駕駛飛行器可行方案及政策法規研究，澳門基金會，2026–2027，主持。

澳門非標準住宅門牌自主識別與定位系統研究，澳門教育協會，2026–2027，主持

基於神經引導與多態融合的自進化共情交互系統研究，澳門教育協會，2026–2027，共同主持

專利申報

實時獲取四維振動信息的測量方法 (CN103971409B, 2014)

一種基於 RGB-D 傳感器的足部三維測量與重建方法 (CN103971409B, 2017)

一種多 RGB-D 傳感器的足部三維信息測量方法 (CN104126989B, 2016)

Research Outputs

Papers Under Review

1. W. Zhang, Q. Zhang, M. Xu, M. You, H. Shen, Z. He, K. Jin, D.F. Wong, T. Fang, "Agri-CPJ: A training-free explainable framework for agricultural pest diagnosis using caption-prompt-judge and LLM-as-a-judge", *Expert Systems with Applications*, Under Review (Paper ID: ESWA-D-26-15157), 2026.
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Journal Publications

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2. Z.H. Tan, H.H. Shen*, "Lyapunov-based emotion-aware switching in hybrid human artificial intelligence customer service systems", *Information Sciences*, Accepted, 2026. (JCR Q1, TOP)
3. R. Chen*, J. Xie, Y. Liu, H. Chen, S. Tang, J. Cheng, H.H. Shen, Z. Tan, "A novel complex network framework: Multi-span transition network with Riemann similarity measure", *Engineering Applications of Artificial Intelligence*, Accepted, 2025. (JCR Q1, TOP)
4. H.H. Shen, W.F. Xie*, N.Y. Zhu, "Degeneracy-Aware Full-Pose Path Planning Strategy for Robot Manipulator", *IEEE Transactions on Systems, Man and Cybernetics: Systems*, Vol. 54, No. 8, pp. 4955-4965, 2024. (JCR Q1, TOP, IF: 8.6)
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17. X. Zhou*, H.H. Shen, B. He, "Birth Intensity Estimation Method for Multi-target Video Tracking", *Journal of Computer Aided Design & Computer Graphics*, Vol. 26, No. 12, pp. 2223-2231, 2014. (JCR Q4, IF: 0.89)

Conference Publications

1. S.Y. Zhang, H.Y. Song, Q.X. Wang*, H.H. Shen, Y. Pei, "A Test Oracle for

Reinforcement Learning Software Based on Lyapunov Stability Control Theory", in **Proceedings of the IEEE/ACM 47th International Conference on Software Engineering (ICSE 2025)**, April 27-May 3, 2025, Ottawa, Canada, pp. 502-513. (Top conference in software engineering, **Distinguished Paper Award**)

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Funded Research Projects

- Feasible Strategies and Regulatory Framework for Cross-Border Low-Altitude UAV Operations in Macau-Zhuhai-Hengqin, Funded by Fundação Macau, 2026–2027, Principal Investigator.
- Autonomous Recognition and Localization System for Non-Standard Residential Address Plates in Macau, Funded by Associação de Educação Millennium, 2026–2027, Principal Investigator.
- Neural-Guided, Multimodal Fusion-Based Self-Evolving Empathetic Interaction System, Funded by Associação de Educação Millennium, 2026–2027, Co-Principal Investigator.

Patents

- Measurement method for acquiring four-dimensional vibration information in real time (CN103971409B, 2014)
- A Method for Foot Three-Dimensional Measurement and Reconstruction with an RGB-D Sensor (CN103971409B, 2017)
- A Measuring Method for Three-Dimensional Foot Surface Information with Multiple RGB-D Sensors (CN104126989B, 2016)