

Xin Ma | Curriculum Vitae

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RESEARCH INTERESTS

- Robotics: Medical Robot; Soft Robot; UAV; Hopping Robot;
- Control and Automation: Vision Servoing; Learning Control;
- Sensing: 3D Reconstruction; Stereo Vision; Camera Calibration;
- Aerospace Engineering: Wind Tunnel Testing.

WORK EXPERIENCES

- **Research Assistant Professor** Dec. 2021 until now
Mechanical and Automation Engineering department, The Chinese University of Hong Kong, Hong Kong China.
- **Research Scientist** Apr. 2021 until now
Medical Robotics Center, Chinese University of Hong Kong, Hong Kong, China.
- **Postdoctoral Researcher** Oct. 2019 - Apr. 2021
School of Engineering Technology, Purdue University, USA.
Supervisor: Richard Voyles, IEEE Fellow
- **Research Fellow** Jun. 2019 - Oct. 2019
Nanyang Technological University, Singapore.
- **Postdoctoral Fellow** Aug. 2017 - Jun. 2019
Surgery Department, Chinese University of Hong Kong, Hong Kong, China.

EDUCATION

- **Ph.D.** 2017, Dalian University of Technology. Sep. 2013 — Aug. 2017
Major: Mechatronic Engineering
Supervisor: Zhenyuan Jia (President of Dalian University of Technology)
Cumulative GPA: 83.9/100
- **M.Sc.** 2013, Dalian University of Technology. Sep. 2011 — Sep. 2013
Major: Mechatronic Engineering
Supervisor: Wei Liu
Cumulative GPA: 90/100
- **B.S.** 2011, Dalian University of Technology. Sep. 2007 — Sep. 2011

Major: Measurement & Control Technology and Instruments

Minor: Japanese

Cumulative GPA: 84.2/100

AWARDS AND HONORS

- Internet + National Competition Gold Medal, Instructor.
- Third Prize, Professor Charles Kao Student Creativity Award, Instructor.
- Postdoctoral fellowship. Awarded by Hong Kong government, 2018.6.
- National Graduate Student Scholarship (2/36), Awarded by Ministry of Education, P.R. China, 2015.11.
- National Graduate Student Scholarship (6/212), Awarded by Ministry of Education, P.R. China, 2012.11.
- Fellowship for Outstanding PhD Proposal Thesis. (1%, 12 recipients in DUT). Awarded by DUT, 2016.10.
- Prize for Research Excellence (1%, 10 recipients in DUT). Awarded by DUT, 2016.4.
- Scholarship Awarded by Dongfeng Nissan (1/36), 2014.12.
- Scholarship Awarded by Mitsui Chemicals (1/212), 2012.12.
- Outstanding Graduate Student (10%). Awarded by DUT, 2015.12.
- Outstanding Student Leader (5%). Awarded by DUT, 2014.12.
- Outstanding Student Leader (5%). Awarded by DUT, 2013.11.
- Outstanding Graduate Student (10%). Awarded by DUT, 2013.12.
- First Class Scholarship (40%). Awarded by DUT, 2011-2013
- Outstanding Graduate Student (10%). Awarded by DUT, 2012.10.
- Outstanding Student Leader (5%). Awarded by DUT, 2012.10.
- Outstanding Bachelor Degree Receiver, Awarded by DUT, 2011.5.
- Outstanding Bachelor Degree Receiver, Awarded by Education Bureau of Dalian City, 2011.
- Scholarship for Excellence in Innovation, (5%). Awarded by DUT, 2010.11.
- Scholarship for Excellence in Recreation and Sports, (5%). Awarded by DUT, 2010.11.
- Scholarship for Excellence in Social Work, (5%). Awarded by DUT, 2009.10.
- Scholarship for Excellence in Innovation, (5%). Awarded by DUT, 2009.10.
- Scholarship for Excellence in Intellectual and Moral Qualities, (5%). Awarded by DUT, 2009.10.
- Scholarship for Excellence in Academic Study, (5%). Awarded by DUT, 2008.10.

PROFESSIONAL EXPERIENCE

Academic Service:

- Organizer of ICRA 2021 workshop:” No-Touch Care for Worker Safety During Pandemic Response”

Website: <https://www.purdue.edu/crl/PandemicWorkshop/WorkshopSchedule.html>

- Organizer of IEEE CASE 2023 workshop:” Dexterous medical robot: design, sensing and control”
- Program Committee in IEEE/IFTToMM International conference on Reconfigurable Mechanisms and Robots (ReMAR2024)
- Editor in Special Issue “Advancing Neural Network-Based Intelligent Algorithms in Robotics: Challenges, Solutions, and Future Perspectives” in Frontiers in Neurorobotics Journal
- Reviewer: Invited reviewers for 13 journals and five conference proceedings

Grants:

- National Natural Science Foundation of China, Science Foundation for Young People, 52205032, Design, optimization and human-machine collaborative control method of multi-layer morphic rigid flexible hybrid structure, 2023-01-01 to 2025-12-31, 300,000 HKD, in progress, **PI**.
- RGC-GRF grant. 14204423, “Magnetically driven robot equipped with flexible manipulators and soft anchors for endoluminal surgery n the depth of colon”, 2024-01-01 to 2026-12-31, 628,000 HKD, in progress, **PI**.
- Guangdong Provincial Natural Science Foundation, Research on Key Technologies of Rigid-Flexible Hybrid Medical Robot with High Dexterity, 2023-01-01 to 2025-12-31, 100,000 HKD, in progress, **PI**.
- SHIAE Fund, Design, Optimization, and Experimental Validation of a Handheld Variable-Curvature Hybrid-Structure Robotic Instrument (HVHRI) for Maxillary Sinus Surgery, 2023-07 ~ 2025-07, 525,000 HKD, in progress, **PI**.
- The Chinese University of Hong Kong, 178920425, Design and Fabrication of Novel Morphing Tilted Hexarotor and Dexterous Aerial Manipulators for Restricted Space Assembly Operation, 2022-07 ~ 2023-06, 150,000 HKD, in progress, **PI**.
- Research Grants Council (RGC) - General Research Fund (GRF), 390642506, Restricted Space Assembly Operation with Morphing Tilted Hexarotor, Dexterous Aerial Manipulators, and Hybrid Multiple-shooting Differential Dynamic Programming Framework for Robot-Environment Interac, 2023-01 - 2025-12, 896,218 HKD, in progress, **Co-I**.
- Innovation Youth Fund Award, Three-Dimensional Information Reconstruction Based on Rotating Lens, 2016–2017. (**PI**, ¥24,000, USD \$3,530 equivalent.)
- Innovation Youth Fund Award, Flexible Measurement System and Method of Position and Attitude of Affiliated Aircraft Object, 2015– 2016. (**PI**, ¥24,000, USD \$3,530 equivalent.)
- University Innovation Research Training Award, Virtual Mechanical Laboratory, 2010-2011 (**PI**, ¥2,000, USD \$294 equivalent.)

- CAST-BISEE Innovation Fund by Beijing Institute of Satellite Environmental Engineering, Research on Compensation Precision of Photogrammetry in Complex Environment, 2015. (co-**PI**, The main participant ¥50,000, USD \$7,353 equivalent.)
- Production and Research Fund, Aviation Industry Corporation of China, cxy2014DLLG23, Research on Active Vibration Suppression of Wind Tunnel Based on Piezoelectric and Magnetostrictive Hybrid Actuators, 2015 (**co-I**, The main participant ¥800,000, USD \$117,647 equivalent.)
- National Natural Science Foundation of China, 51375057, Research on pose measurement technology of small, multi-dimensional and high-speed moving object in complex environment, 2013 (**co-I**, The main participant ¥800,000, USD \$117,647 equivalent.)
- General Research Fund, Department of Education in Liaoning Province, L2013035, Visual Measurement of High-speed Moving Targets' Pose in Complex Service Environment, 2013, (**co-I**, The main participant ¥30,000, USD \$4,412 equivalent.)

SUMMARY OF PUBLICATIONS

- First author journal publications: **11** Corresponding publications: **18**
- Published/accepted journal papers: **54** Published conference proceedings: **20**
- Google scholar citations: **837** H-index: **16**
- US Patents Granted: **1** US Patents Pending: **3**
- Chinese Patents Granted: **17**

PUBLICATION LIST

Refereed Journal Publications ([corresponding author*](#))

1. Tianle Pan, Jianshu Zhou, Zihao Zhang, Yunhui Liu, **Xin Ma***, “Transformable soft gripper (TSG): Uniting grasping and suction for amphibious cross-scale objects grasping”, *Soft Robotics* (IF: 6.4), *accepted*, 2024.
2. Mei Liu, Long Jin, **Xin Ma***, “Cerebellum-Inspired Learning and Control Scheme for Redundant Manipulators at Joint Velocity Level”, *IEEE Transactions on Cybernetics* (IF: 9.4), *accepted*, 2024.
3. Mei Liu, **Xin Ma***, “Few-Shot-Learning-Like Neural Dynamics for Time Dependent Multi-Linear M-Tensor Equation”, *IEEE Transactions on Industrial Informatics* (IF: 11.7), *accepted*, 2024.
4. Yi Yang, Puchen Zhu, Weibing Li, Richard M. Voyles, and **Xin Ma***, “A Fractional-Order Gradient Neural Solution to Time-Variant Quadratic Programming with Application to Robot Motion Planning”, *IEEE Transactions on Industrial Electronics* (IF: 7.5), *accepted*, 2024.

5. Xuchen Wang, **Xin Ma***, Puchen Zhu, Wee Shen Ng, Xianfeng Xia, Russell H. Taylor, and Kwok Wai Samuel Au, “Design, Optimization, and Experimental Validation of a Handheld Nonconstant-Curvature Hybrid-Structure Robotic Instrument for Maxillary Sinus Surgery”, *IEEE/ASME Transactions on Mechatronics (IF: 6.1)*, accepted, 2024.
6. **Xin MA***, Puchen Zhu, Xiao Li, Xiaoyin Zheng, Jianshu Zhou*, Xuchen Wang, Kwok Wai Samuel Au. A Minimal Set of Parameters Based Depth-Dependent Distortion Model and Its Calibration Method for Stereo Vision Systems, *IEEE Transactions on Instrumentation and Measurement (IF: 5.6)*, accepted, 2024.
7. Jianshu Zhou, Junda Huang, **Xin MA***, Andy Lee, Kazuhiro Kosuge, Yunhui Liu*. Design, Modeling, and Control of Soft Syringes Enabling Two Pumping Modes for Pneumatic Robot Applications, *IEEE/ASME Transactions on Mechatronics (IF: 6.1)*, accepted, 2024.
8. Mei Liu, Kun Liu, Puchen Zhu, Guoqian Zhang, **Xin Ma***, and Mingsheng Shang*. Data-Driven Remote Center of Cyclic Motion (RC2M) Control for Redundant Robots with Rod-Shaped End-Effector, *IEEE Transactions on Industrial Informatics (IF: 11.7)*, accepted, 2024.
9. Weibing Li, Yanying Zou, **Xin Ma***, Binbin Qiu, Dongsheng Guo. Novel Neural Controllers for Kinematic Redundancy Resolution of Joint-Constrained Gough–Stewart Robot, *IEEE Transactions on Industrial Informatics (IF: 11.7)*, accepted, 2023.
10. **Xin Ma**, Xuchen Wang, Zihao Zhang, Puchen Zhu, SS Cheng, Kwok Wai Samuel Au*, Design and Experimental Validation of a Novel Hybrid Continuum Robot with Enhanced Dexterity and Manipulability in Confined Space, *IEEE/ASME Transactions on Mechatronics (IF: 6.1)*, accepted, 2023.
11. Weibing Li, Xuchen Wang, **Xin Ma***, Yongping Pan, “A Strictly Predefined-Time Convergent and Noise-Tolerant Neural Model for Solving Linear Equations with Robotic Applications”, *IEEE Transactions on Industrial Electronics (IF: 7.5)*, accepted, 2023.
12. Xuchen Wang, Junyan Yan, **Xin Ma***, Ying Kuen Jason Chan, Russell H. Taylor, Shing Shin Cheng* and Kwok Wai Samuel Au, “Hybrid-Structure Hand-Held Robotic Endoscope for Sinus surgery with Enhanced Distal Dexterity”, *IEEE/ASME Transactions on Mechatronics (IF: 6.1)*, accepted, 2022.
13. **Xin Ma**, Chengzhi Song, Long Qian, Weixiao Liu, Philip Chiu, Zheng Li*, “Augmented Reality Assisted Autonomous View Adjustment of a 6-DOF Robotic Stereo Flexible Endoscope”, *IEEE Transactions on Medical Robotics and Bionics*, accepted, 2022.
14. Jiajun An, **Xin Ma***, Chun Ho David LoS, Xiaoyu Chu, Kwok Wai Samuel Au*, “Design and Experimental Validation of a Monopod Robot With 3-DoF Morphable Inertial Tail for Somersault”, *IEEE/ASME Transactions on Mechatronics (IF: 6.1)*, accepted, 2022.
15. **Xin Ma**, Wei Liu*, Ling Chen, Xiao Li, Zhenyuan Jia. “Simulative technology for auxiliary fuel tank separation in a wind tunnel.” *Chinese Journal of Aeronautics (IF: 5.3)*, 29(3):608–616, June 2016.
16. Jing Huang, Xiangyu Chu, **Xin Ma**, Kwok Wai Samuel Au*, “Deformable Object

Manipulation with Constraints using Path Planning and Tracking”, *IEEE transactions on Robotics (IF: 9.4)*, 2023, accepted.

17. **Xin Ma**, Chengzhi Song, Philip Wai Yan Chiu, Zheng Li*, “Autonomous Flexible Endoscope for Minimally Invasive Surgery with Enhanced Safety”, *IEEE Robotics and Automation Letters (IF: 4.6)*, 4(3), 2607-2613, 2019.
18. **Xin MA**, Chengzhi SONG, Philip Waiyan CHIU, and Zheng LI*. “Visual Servo of a 6-DOF Robotic Stereo Flexible Endoscope Based on da Vinci Research Kit (dVRK) System”, *IEEE Robotics and Automation Letters (IF: 4.6)*, 5(2), 820-827, 2020.
19. **Xin Ma**, Peng Wang, Minxin Ye, Philip Wai Yan Chiu, Zheng Li, “Shared Autonomy of a Flexible Manipulator in Constrained Endoluminal Surgical Tasks”, *IEEE Robotics and Automation Letters (IF: 4.6)*, 3 (2019): 3106-3112.
20. **Xin Ma**, Philip Chiu, Zheng Li. “Shape Sensing of Flexible Manipulators based on Statics Model and Bezier Curve”, *IEEE sensors journal (IF: 4.3)*, 10(21), 11684-11691, 2020.
21. **Xin Ma**, Philip Wai Yan Chiu, Zheng Li. “Shape Sensing of Flexible Manipulators with Visual Occlusion based on Bezier Curve”, *IEEE Sensors Journal (IF: 4.3)*. 18(19):6412-6422, Oct. 2018.
22. **Xin Ma**, Philip Wai Yan Chiu, Zheng Li. “Real-Time Deformation Sensing for Flexible Manipulators with Bending and Twisting”, *IEEE Sensors Journal (IF: 4.3)*. 18(15):8133-8142, Jun 2018.
23. Song Chengzhi#, **Xin MA #**, Xia Xianfeng, Philip Wai Yan Chiu, Zheng Li, “A Robotic Flexible Endoscope with Shared Autonomy: phantom study with cholecystectomy”, *Surgical Endoscopy*, (2019): 1-12.
24. Pei-Yao Li1, De-Ning Song, Jing-Hua Li, Yu-Guang Zhong, Jian-Wei Ma, **Xin Ma**. Five-axis toolpath re-scheduling for facilitating assisted supporting thin-walled blade machining by decreasing axis sensitivity, *The International Journal of Advanced Manufacturing Technology*, accepted, 2024.
25. Wei Liu#, **Xin Ma #**, Zhenyuan Jia, Xiao Li, “A Novel Vision-Based Pose Measurement Method Considering the Refraction of Light”, *Sensors (Basel)*.
26. Li Weibing, **Xin Ma**, J Luo, L Jin, “A Strictly Predefined-Time Convergent Neural Solution to Equality and Inequality Constrained Time-Variant Convex Quadratic Programming”, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2020.
27. Upinder Kaur, Rammohan Sriramdas, Xiaotian Li, **Xin Ma**, Arunashish Datta, Barbara Roqueto dos Reis, Shreyas Sen, Kristy Daniels, Robin White, Richard M. Voyles, Shashank Priya, “Indwelling robots for ruminant health monitoring: A review of elements, Smart Agricultural Technology”, Volume 3, 2023, 100109.
28. X Li, X Chen, W Li, X Yin, H Chen, J Zhou, **X Ma**, “High-accuracy calibration method for an underwater one-mirror galvanometric laser scanner”, *Optics Express*, 31 (4), 5973-5989.

29. Xiao Li, Jingyu Zhou, Haijun Xin, Wei Li, Xiaokang Yin, Xin'an Yuan, Huaiyuan Chen, Xingpei Chen, and **Xin Ma**, "Vision measurement system for geometric parameters of tubing internal thread based on double-mirrored structured light," *Opt. Express*, 30, 47701-47719 (2022).
30. Xiao Li, Wei Li, Haijun Xin, Jingyu Zhou, Huaiyuan Chen, Xingpei Chen, Xiaokang Yin, Xin'an Yuan, and **Xin Ma**, "Single-lens multi-mirror laser stereo vision-based system for measuring internal thread geometrical parameters," *Opt. Express*, 30, 47625-47646 (2022).
31. Jinfei Hu, Zheng Chen, **Xin Ma**, Han Lai, Bin Yao, "A Telepresence-guaranteed Control Scheme for Teleoperation Applications of Transferring Weight-unknown Objects", *IEEE/CAA Journal of Automatica Sinica*, accepted, 2022.
32. Haoguang Yang, Mythra Varun Balakuntala, Upinder Kaur, Jhon Jairo Quiñones, Abigayle Moser, Ali Doosttalab, Antonio Esquivel-Puentes, Tanya Purwar, Luciano Castillo, **Xin Ma**, Richard Voyles, "Robotics and Autonomous Systems Occupant-Centric Robotic Air Filtration and Planning for Classrooms for Safer School Reopening Amid Respiratory Pandemics", *Robotics and Autonomous Systems*, accepted, 2022.
33. Li X, Li W, Yin X, **Ma X**, Zhao J. Camera-Mirror Binocular Vision-Based Method for Evaluating the Performance of Industrial Robots. *IEEE Transactions on Instrumentation and Measurement (IF: 5.6)*, 2021 Nov 13;70:1-4.
34. Li X, Li W, **Ma X**, Yin X, Chen X, Zhao J. Spatial light path analysis and calibration of four-mirror-based monocular stereo vision. *Optics Express*, 2021 Sep 27;29(20):31249-69.
35. Zijian Qiao, Jian Liu, **Xin Ma**, Jinjiang Liu, "Double stochastic resonance induced by varying potential-well depth and width", *Journal of the Franklin Institute* 358(3):2194-2211, 2021.
36. Xiao Li, Wei Li, Xinan Yuan, Xiaokang Yin and **Xin Ma**, "DoF-dependent and Equal-partition based Lens Distortion Modeling and Calibration Method for Close-range Photogrammetry", *Sensors*, 20(20), 5934, 2020.
37. Jinfei Hu, Zheng Chen, Han Lai, **Xin Ma**, Bin Yao, "Desired Compensation Adaptive Robust Repetitive Control of a Multi-DoFs Industrial Robot", submitted to *ISA Transactions*, accepted, 2021.
38. L Zhang, **Xin Ma**, Y Wang, R Song, J Li, W Yuan, "The increasing district heating energy consumption of the building sector in China: Decomposition and decoupling analysis" *Journal of Cleaner Production*, 271, 122696, 2020.
39. Linghui Zhang, Guobao Song, **Xin Ma**, Changhong Zhan, Shushen Zhang, "Decarbonisation pathways towards achieving the Intended Nationally Determined Contribution at the subnational level via multi-objective optimisation under uncertainty: An investigation of China's residential building sector". *Journal of Cleaner Production*, 272, 122760, 2020.
40. Wei Liu (co-supervisor), **Xin Ma**, Ling Chen, Zhenyuan Jia, Weixiao Liu, Xiao Li, Jiakun Zhang and Jiwen Lu. "Remote-controllable flexible pose measurement system and method for a moving target based on monocular vision," *Chinese Journal of Aeronautics*, 31(1):89–98,

January 2018.

41. Wei Liu (co-supervisor), **Xin Ma**, Xiao Li, Ling Chen, Yang Zhang, Xiaodong Li, Zhiliang Shang and Zhenyuan Jia. “An Experimental System for the Release Simulation of Internal Stores in a Supersonic Wind Tunnel,” *Chinese Journal of Aeronautics*, 30(1):186-195, 2017.
42. Wei Liu (co-supervisor), **Xin Ma**, Zhenyuan Jia, Yang Zhang, Zhiliang Shang and Xiao Li. “Position and attitude measurement of high-speed isolates for hypersonic facilities,” *Measurement*, 62:63–67, February 2015.
43. Zhenyuan Jia (supervisor), **Xin Ma**, Wei Liu, Wenbo Lu, Xiao Li, Ling Chen, Zhengqu Wang and Xiaochun Cui. “Pose measurement method and experiments for high-speed rolling targets in a wind tunnel.” *Sensors (Basel)*, 14(12):23933–53, December 2014.
44. Wei Liu (co-supervisor), **Xin Ma**, Xiao Li, Ling Chen, Yang Zhang, Xiaodong Li, Zhiliang Shang and Zhenyuan Jia. “High-precision pose measurement method in wind tunnels based on laser-aided vision technology,” *Chinese Journal of Aeronautics*, 160(4):1121–1130, August 2014.
45. Wei Liu, Zhenyuan Jia, Fuji Wang, **Xin Ma** and Wenqiang Wang, Xinghua Jia and Di Song. “An improved online dimensional measurement method of large hot cylindrical forging,” *Measurement*, 45(8):2041–2051, October 2012.
46. Linghui Zhang, **Xin Ma**, Shushen Zhang, “District Heating Energy Consumption of the Building Sector in the Jing-Jin-Ji Urban Agglomeration: Decomposition and Decoupling Analysis”, *Sustainability*.
47. Wei Liu, **Xin Ma**, Xiao Li, Zhenyuan Jia, Wei Wang and Yang Zhang. “A calibration method of binocular vision system for large forging dimension measurement, Sensors and Transducers,” *Sensors and Transducers*, 145(10):119–129, September 2012.
48. Wei Liu, Xianming Tu, Zhenyuan Jia, Wenqiang Wang, **Xin Ma**. “An improved surface roughness measurement method for micro-heterogeneous texture in deep hole based on gray-level co-occurrence matrix and support vector machine,” *The International Journal of Advanced Manufacturing Technology*, 69(1-4):583–593, October 2013. Sensors and Transducers 145(10):119–129, September 2012.
49. Wei Liu, Zhenyuan Jia, Xiao Li, Hongyue Yan, **Xin Ma**. “A three-dimensional triangular vision-based contouring error detection system and method for machine tools.” *Precision Engineering*, 50: 85-98. October 2017.
50. Wei Liu , Xiao Li , Zhenyuan Jia , Hui Li , **Xin Ma** , Hongyue Yan , Jianwei Ma, ”Binocular-vision-based error detection system and identification method for PIGEs of rotary axis in five-axis machine tool” *Precision Engineering*, 51:208-222. January 2018.
51. Wei Liu, Shuangjun Liu, Yang Zhang, Zhiliang Shang, **Xin Ma**. “An image acquiring method for position and attitude measurement of high-speed target in wind tunnel.” *Sensors and Transducers*, 160(12):635-644, 2013.
52. Wei Liu, Xiao Li, **Xin Ma**, Zhenyuan Jia, Ling Chen and Weixiao Liu. “Camera calibration

- method for close range large field of view camera based on compound target,” *Infrared and Laser Engineering*, 45(7):230-236 2016. (printed in Chinese with English abstract).
53. Wei Liu, Ling Chen, **Xin Ma**, Xiao Li and Zhenyuan Jia. “Monocular position and pose measurement method for high-speed targets based on colored images,” *Chinese Journal of Scientific Instrument*, 5(6):340– 352, 2016. (printed in Chinese with English abstract).
 54. Wei Liu, Zhiliang Shang, **Xin Ma**, Yang Zhang, Xiao Li and Zhenyuan Jia. “Position and attitude measuring method of auxiliary fuel tank based on color-coding in wind tunnel,” *Acta Aeronautica ET Astronautica Sinica*, 36(5):1556–1563, May 2015. (printed in Chinese with English abstract).
 55. Wei Liu, Yang Zhang, **Xin Ma**, Zhiliang Shang and Zhenyuan Jia. “Measurement method for moment of inertia based on binocular vision,” *Chinese Journal of Scientific Instrument*, 15(9):1972–1978, October 2014. (printed in Chinese with English abstract).

Conference paper (corresponding author*, co-first author#):

1. Puchen Zhu, Huayu Zhang, **Xin MA***, Xuchen Wang, Samuel Au, “A CT-guided Control Framework of a Robotic Flexible Endoscope for the Diagnosis of the Maxillary Sinusitis”, *IEEE IROS*, accepted, 2024.
2. Yi Yang, Puchen Zhu, Weibing Li, Richard M. Voyles, **Xin Ma***, “A Fractional-Order Recurrent Neural Network Model for Time-Variant Quadratic Programming in Robot Motion Planning”, *IEEE/ASME International Conference on Advanced Intelligent Mechatronics 2024*, accepted, 2024.
3. Yi Yang, Weibing Li, Jianshu Zhou, Junda Huang, Jinfei Hu, Richard M. Voyles, and **Xin Ma***, “PTC-FOZNN: A Strictly Predefined-Time Convergent Fractional-Order Recurrent Neural Network for Solving Time-Variant Quadratic Programming”, (*IEEE 18th International Conference on Control & Automation*), accepted, 2024.
4. Huayu Zhang, Jiajun An, Tianle Pan, Upinder Kaur, Zhijian Wang, Qiguang He*, **Xin Ma***, “Miniature Reconfigurable Modular Soft Robots Using Liquid Crystal Elastomer Actuation”, (*2024 6th International Conference on Reconfigurable Mechanisms and Robots*), accepted, 2024.
5. **Xin Ma**, Xuchen Wang, Rui Cao, K. W. Samuel Au, “Design, Teleoperation Control and Experimental Validation of a Dexterous Robotic Flexible Endoscope for Laparoscopic Surgery”, (*IEEE IROS*) 2022.
6. Jawad Mehmood Butt, **Xin Ma***, Xiangyu Chu, K. W. Samuel Au, “Adaptive Flight Stabilization Framework for a Planar 4R-Foldable Quadrotor: Utilizing Morphing to Navigate in Confined Environments”, (*American Control Conference, IEEE*), accepted, 2022.
7. Upinder Kaur, **Xin Ma**, Vishnunandan L.N Venkatesh, Richard M Voyles, “Haptics with Multimodal Sensing for Human-Like Perception-on-the-Fly”, (*IEEE CASE*) accepted, 2022.
8. Praveen Abbaraju, **Xin Ma***, Guangying Jiang and Richard M. Voyles, “Aerodynamic

- Modeling for Multirotor UAVs with Nonparallel Actuators”, (*IEEE IROS*) 2021.
9. Mythra V. Balakuntala, Upinder Kaur, **Xin Ma***, Juan Wachs, Richard M. Voyles, “Learning Multimodal Contact-Rich Skills from Demonstrations Without Reward Engineering”, (*IEEE ICRA*) 2021.
 10. Xiao Li, Wei Li, **Xin Ma**, Xiaokan Yin, “Monocular Stereo Vision Based Method for Validating Path Accuracy of Industrial Robots”, (*IEEE I2MTC*), 2021.
 11. Abbaraju Praveen, **Xin Ma**, Yuanmeng Huang, Richard M. Voyles, “Autonomous Physical Interaction of Exhaust Shafts and Smokestacks Using a Fully-Actuated UAV”, submitted to *International Symposium on Safety, Security and Rescue Robotics (IEEE SSRR)* 2020.
 12. Long Qian, Chengzhi Song, Yiwei Jiang, QI LUO, **Xin Ma**, Philip, Wai-yan Chiu, Zheng Li, Peter Kazanzides. “*FlexiVision: Teleporting the Surgeon's Eyes via Robotic Flexible Endoscope and Head-Mounted Display*”, (*IEEE IROS*), accepted, 2020.
 13. Praveen Abbaraju, **Xin Ma***, Harikrishnan Manoj Krishnan, L.N Vishnunandan Venkatesh, Richard Voyles, “*Inspection-on-the-fly using Hybrid Physical Interaction Control for Aerial Manipulators*”, (*IEEE IROS*), accepted, 2020.
 14. **Xin MA**, Chengzhi SONG, Philip Waiyan CHIU, and Zheng LI. Visual Servo of a 6-DOF Robotic Stereo Flexible Endoscope Based on da Vinci Research Kit (dVRK) System. (*IEEE ICRA*) 2020.
 15. Naveed, **Xin Ma**, Richard Voyles, “Form + Function 4-D Printing: Synthesizing Polymers with Sensing and Computation for the Co-Design of Smart Products”, *Materials Research Society (MRS) Spring Meeting*, 2020.
 16. **Xin Ma**, Peng Wang, Minxin Ye, Philip Wai Yan Chiu, Zheng Li, Shared Autonomy of a Flexible Manipulator in Constrained Endoluminal Surgical Tasks. (*IEEE IROS*) 2019.
 17. **Xin Ma**, Chengzhi Song, Philip Wai Yan Chiu, Zheng Li, “Autonomous Flexible Endoscope for Minimally Invasive Surgery with Enhanced Safety.” (*IEEE ICRA*) 2019.
 18. Wei Liu, **Xin Ma**, Zhenguan Jia and Bing Liang. “A monocular vision 3D measurement method based on rotating lens,” Submitted to *IEEE International Instrumentation and Measurement Technology Conference (IEEE I2MTC)* 2017.
 19. **Xin Ma**, Wei Liu, Xiao Li, Zhenyuan Jia, Ling Chen and Weixiao Liu. “A Photogrammetry Pose Measurement Method for Moving Targets in a Wind Tunnel.” *IEEE I&M International Instrumentation and Measurement Technology Conference (IEEE I2MTC)* 2016.
 20. Wei Liu, **Xin Ma**, Ling Chen, Jiwen Lu and Zhenyuan Jia. “A monocular vision 3D measurement method based on refraction of light.” *IEEE International Symposium on Industrial Electronics (IEEE ISIE)* 2016.

US Patents:

1. **Ma Xin**; Zhu Puchen; Wang Xuchen; Kwok Wai Samuel Au, Simplified depth-dependent

lens distortion model and its calibration method, 2023-9-3, US Patent Pending, US 63/536,431.

2. **Ma Xin**; Zhang Zihao; Wang Xuchen; Kwok Wai Samuel Au, Cam-based Backend Transmission Mechanism for Driving Four-cable Wristed Instrument, 2023-8-7, US Patent Pending, US 63/531,314.
3. Yunhui Liu, Tian Le Pan, Jiajun An, **Xin Ma**, Jianshu Zhou. SOFT GRIPPERS, METHODS OF MAKING THE SAME, SYSTEMS AND METHODS OF CONTROLLING THE SAME, 2023-12-26, US Patent Pending, US 63/608,831.
4. W. Liu, Zhenyuan Jia, Xiao Li, Yi Pan, **X. Ma**. “A monocular-vision-based contouring error detection method for a five-axis machine tool”. US Patent granted; *PCT/CN2017/109782*

Chinese Patents Granted:

1. W. Liu, **X. Ma**, Z. Shang, Y. Zhang, X. Li and Z. Jia “A Fast Method for Extracting Marked and Marked Point Centers” China Patent: 2013105083909 First filed October 25th, 2013.
2. W. Liu, Z. Jia, **X. Ma**, Z. Shang. Y. Zhang, X. Li and R. Fu “A Method of Measuring Moment of Inertia with Binocular Vision” China Patent: 2013104515750 First filed September 28th, 2013
3. W. Liu, Z. Jia, B. Zhang, **X. Ma**, R. Fu and D. Song. “A Model of Flight Vehicles and Its Fabrication” China Patent: 2013101454100 First filed April 24th, 2013
4. W. Liu, Z. Jia, W. Lu, **X. Ma**, X. Cui. Y. Zhang and Z. Shang. “A Pose Measurement Method for High Speed Rolling Body” China Patent: 2013101396567 First Filed April 19th, 2013
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Teaching Experiences

- 2021/2022 Term 2: UGEB2303 Robot in Action
- 2022/2023 Term 1: MAEG4040 Mechatronic System
- 2023/2024 Term 1: MAEG4040 Mechatronic System
- 2024/2025 Term 1: MAEG4040 Mechatronic System

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