

Zixi Chen

E-mail: zc.academic@gmail.com | Homepage: <https://zixichen007115.github.io/> |
Google Scholar: <https://scholar.google.com/citations?user=s78k3cgAAAAJ&hl=en&oi=ao>

Research Interest

Underactuated dexterous hand; Surgical robotics, Continuum robotics; Soft robotics; Vision-based tactile sensing

Research and Working Experience

Vrije Universiteit Brussel, Belgium

Sep. 2026 – Present

Postdoctoral Researcher

Cooperation Professors: Bram Vanderborght

Responsibilities: Assistance in coordinating EU project RESSORT (€9.7 M), Research on underactuated dexterous hand

Ultimage Intelligent Technology (Macau) Ltd., Macao (CN)

Oct. 2025 – Present

Scientific Advisor

Cooperation Professors: Jia Gu

Responsibilities: Development of continuum surgical robotics; Research on rolling joint continuum robotics and teleoperator; PhD student supervision

King's College London and Tsinghua University, China

Nov. 2021 – Sep. 2022

Research Assistant

Cooperation Professors: Shan Luo, Bin Fang

Responsibilities: Physics-based optical tactile sensor simulation, RL-based plasticine manipulation

Education

Scuola Superiore Sant'Anna, Italy

Oct. 2022 – Oct. 2025

Ph.D. in Biorobotics (with distinction)

Supervisor: Cesare Stefanini, Arianna Menciassi (IEEE Fellow)

Thesis: Data-driven Control Approaches for Modular Soft Robots

EPFL, Switzerland

Aug. 2024 – Oct. 2024

Visiting Ph.D. student

Supervisor: Josie Hughes

Imperial College London, United Kingdom

Oct. 2020 – Oct. 2021

M.Sc. in Control Systems (with distinction)

Supervisor: Tae-kyun Kim

Thesis: Data augmentation by adversarial learning

Harbin Institute of Technology (Shenzhen), China

Aug. 2016 – Jun. 2020

B.Eng. in Mechanical Engineering (Outstanding Graduate)

Supervisor: Qingbin Gao

Thesis: Gait Control and Stability Analysis of Biped Robot Walking on a Slope

Publications and Patents

Citations: 637 | h-index: 9 (Google Scholar, Aug 2026)

Five Selected Publications:

- [1] **Z. Chen**, Q. Guan, J. Hughes, et al., "A Versatile Neural Network Configuration Space Planning and Control Strategy for Modular Soft Robot Arms," in *IEEE Transactions on Robotics*, vol. 41, pp. 4269-4282, 2025.
- [2] **Z. Chen**, X. Ren, Y. Hamamatsu, et al., "AdapJ: An Adaptive Extended Jacobian Controller for Soft Manipulators," in *IEEE/ASME Transactions on Mechatronics*, vol. 31, no. 2, pp. 1753-1763, 2026.

- [3] **Z. Chen**, F. Renda, A. Le Gall, et al., "Data-driven Methods Applied to Soft Robot Modeling and Control: A Review," in *IEEE Transactions on Automation Science and Engineering*, vol. 22, pp. 2241-2256, 2025.
- [4] **Z. Chen**, D. Wu, Q. Guan, D. Hardman, F. Renda, J. Hughes, T. G. Thuruthe, C. Della Santina, B. Mazzolai, H. Zhao, and C. Stefanini, "A Survey on Soft Robot Adaptability: Implementations, Applications, and Prospects," in *IEEE Robotics & Automation Magazine*, vol. 33, no. 2, pp. 183-195, 2026.
- [5] **Z. Chen**, M. Bernabei, V. Mainardi, et al., "A Novel and Accurate BiLSTM Configuration Controller for Modular Soft Robots with Module Number Adaptability," in *Soft Robotics* (accepted)

Other Publications:

- [6] Y. Hamamatsu, **Z. Chen**, M. Kruusmaa, et al., "Strouhal-Aware Model Predictive Control for Efficient Multi-Fin Flapping Locomotion" in *IEEE Journal of Oceanic Engineering* (accepted)
- [7] Y. Shao, Y. Zhang, J. Gu, **Z. Chen**, et al., "Deep-Learning-Based Control of a Decoupled Two-Segment Continuum Robot for Endoscopic Submucosal Dissection" in *IEEE/ASME Transactions on Mechatronics* (accepted)
- [8] Y. Sun, S. Zhang, **Z. Chen**, et al., "Soft Contact Simulation and Manipulation Learning of Deformable Objects with Vision-based Tactile Sensor," in *IEEE Transactions on Automation Science and Engineering*, vol. 22, pp. 17618-17630, 2025.
- [9] S. Jing, T. Yao, K. Zhang, D. Wu, Q. Wang, **Z. Chen**, et al., "Ultrasound-Guided Robotic Blood Drawing and In Vivo Studies on Submillimetre Vessels of Rats," in *2025 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 10481-10486, 2025.
- [10] Z. Shen, Y. Sun, S. Zhang, **Z. Chen**, et al., "Simulation of Optical Tactile Sensors Supporting Slip and Rotation Using Path Tracing and IMPM," in *IEEE Robotics and Automation Letters*, vol. 9, no. 12, pp. 11218-11225, 2024.
- [11] W. Liu, Y. Shao, Y. Zhang, **Z. Chen**, et al., "Desectbot: Design and validation of a novel two-segment decoupled continuum robotic system for endoscopic submucosal dissection," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 6983-6989, 2024.
- [12] A. Le Gall, T. Dangel, Z. Chen, et al., "An origami-based fluidic actuator for Minimally Invasive Surgery," in *International Conference and Exhibition on New Actuator Systems and Applications*, pp. 260-262, 2024.
- [13] **Z. Chen**, X. Ren, M. Bernabei, et al., "A Hybrid Adaptive Controller for Soft Robot Interchangeability," in *IEEE Robotics and Automation Letters*, vol. 9, no. 1, pp. 875-882, 2024.
- [14] S. Zhang, Y. Sun, J. Shan, **Z. Chen**, et al., "TIRgel: A Visuo-Tactile Sensor with Total Internal Reflection Mechanism for External Observation and Contact Detection," in *IEEE Robotics and Automation Letters*, vol. 8, no. 10, pp. 6307–6314, 2023.
- [15] **Z. Chen**, S. Zhang, S. Luo, et al., "Tacchi: A Pluggable and Low Computational Cost Elastomer Deformation Simulator for Optical Tactile Sensors," in *IEEE Robotics and Automation Letters*, vol. 8, no. 3, pp. 1239–1246, 2023.
- [16] S. Zhang*, **Z. Chen***, Y. Gao, et al., "Hardware Technology of Vision-Based Tactile Sensor: A Review," in *IEEE Sensors Journal*, vol. 22, no. 22, pp. 21410-21427, 2022.

Patents:

- [1] Y. Shao, **Z. Chen**, J. Gu, et al., "一种经自然腔道手术机器人的集成控制系统," Utility Model Patent, China. (under review)

- [2] L. Yi, **Z. Chen**, Y. Shao, et al., “一种面向直觉操作的主从同构手术机器人主操作手,” Utility Model Patent, China. (under review)
- [3] L. Yi, **Z. Chen**, Y. Shao, et al., “一种主从同构式经自然腔道手术机器人防抖滤波与安全约束控制方法,” Invention Patent, China. (under review)
- [4] Y. Shao, L. Yi, **Z. Chen**, et al., “一种与从端同构映射的手术机器人主操作手及其控制方法,” Invention Patent, China. (under review)

Supervision and Teaching

- Lingxiao Yi (2026), PhD student at City University of Macau. Supervision for planned continuum surgical robotics publication
- Yuhao Sun (2023-2025), master student at Anhui University of Technology. Supervision for TASE paper publication [8].
- Zirong Shen (2024), undergraduate student at Tsinghua University. Supervision for RAL publication [10].

Academic Service

Peer Review Contributions:

npj Robotics, T-RO, TMECH, T-ASE, SoRo, TIE, T-MRB, RAS, RA-L, IROS, ICRA

Workshops:

I am the lead organizer of the serial workshops:

- IROS 2026 workshop 'The SOFT Frontier 4: Intelligent Interactions in Soft Robotics.'
- ICRA 2026 workshop 'The SOFT frontier 3: Soft or Rigid? New Trends in Wearable Robotics.'
- IROS 2025 workshop 'The SOFT frontier 2: practical applications in soft robotics.'
- IROS 2024 workshop 'The SOFT frontier: adaptive technologies in soft robotics.'