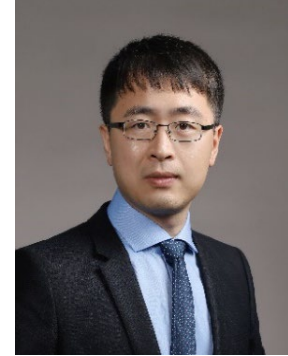


CURRICULUM VITAE

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IDENTIFYING INFORMATION

Education:

- Oct. 2010 ~ Mar. 2014, **Ph. D.** in Micro-Nano Systems Engineering, **Nagoya University**, Japan. Supervisor: Prof. Toshio Fukuda
- Sept. 2008 ~ Jun. 2010, **MS.** in Mechanical Engineering, Huazhong University of Science and Technology (HUST), China. Advisor: Prof. Sheng Liu
- Sept. 2004 ~ Jun. 2008, **B. Sc.** in Mechanical Engineering, Huazhong University of Science and Technology (HUST), China.

Positions/Employment:

- Jan. 2021 ~ Present, **Associate Professor**, Department of Mechanical and Energy Engineering, Southern University of Science and Technology (SUSTech), Shenzhen, China.
- Jun. 2018 ~ Jan. 2021, **Assistant Professor**, Department of Mechanical and Energy Engineering (SUSTech), Shenzhen, China
- May 2014 ~ May 2018, **Postdoctoral Associate**, Multi-Scale Robotics Lab, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, Collaboration supervisor: Prof. Bradley Nelson
- Sept. 2015 ~ May 2018, **Associate Fellow**, Max Planck ETH Center for Learning Systems

Current Membership in Professional Organizations

- **Senior Member**, IEEE
- **Senior Member**, Chinese Society of Micro-Nano Technology
- **Member**, Chinese Association of Automation
- **Member**, Micro-Nano Robotics Council, Chinese Society of Micro-Nano Technology
- **Member**, ASME
- **Editor**, Cyborg and Bionic Systems, 2023-2025
- **Youth Editor**, Cyborg and Bionic Systems, 2021-2023
- **Guest Editor**, Gels (IF: 4.6)
- **Guest Editor**, Micromachines (IF: 3.4)

HONORS AND AWARDS

- **Outstanding in Faculty Performance Assessment in SUSTech(Top 20%) (2019, 2021, 2022)**
- **2022, Best Paper Award, IEEE International Conference on Cyborg and Bionic Systems (CBS) 2022**
- **2022, Outstanding member of the Communist Party of SUSTech**
- **2022, Outstanding member of the Faculty Union of SUSTech**
- **2022, Director of Studio for “Academic Leader and Leader for Party Work” of SUSTech**
- **2022, Two-Star Pioneer Employee of SUSTech**
- **2021, National Youth Scholar of China**
- **2021, High-level Talents of Shenzhen Peacock Talents Program, Level B**
- **2021, Excellent Mentor of Zhiren College**
- **2021, Outstanding member of the Communist Party of the School of Engineering of SUSTech**
- **2020, Excellent Supervisor of SUSTech**
- **2020, Outstanding member of the Communist Party of SUSTech**
- **2018, High-level Talents of Shenzhen Peacock Talents Program, Level C**
- **2015, Winner of Mobile Microrobotics Challenge on Microassembly (ICRA 2015)**
- **2013, Best Paper Award (IEEE MHS 2013)**

- 2011, Outstanding Graduate Student Award of Nagoya University

SUMMARY OF RESEARCH

Grants and Contracts at SUSTech

My research has been funded by national and local funding agencies since 2018. In brief, **15 external competitive grants as PI** with a total funding amount exceeding **14.5 million RMB**. Meanwhile, I received overall start-up funding and matching funding (The National Youth Talent Project) of **5 million RMB**, and obtained **over 1 million RMB** from several Key Laboratories as a Core Member.

- [1]. **PI**, *Automated Intracellular Sampling and In-situ Sensing for Tumor Cells: System Development and Application*, National Key Research and Development Program of China, Grant No. 2023YFC2415900, ¥ 2,000,000, 2023.11~2026.10.
- [2]. **PI**, *High-efficiency Swarm Control of Micro- and Nanorobots in an In Vitro Enclosed Environment*, National Natural Science Foundation of China (NSFC), Grant No. 62373182, ¥ 500,000, 2024.01~2027.12.
- [3]. **PI**, *Autonomous Miniature Underwater Robot*, Science and Technology Commission of the Central Military Commission, Grant No. 21-163-15-ZT-005-002-07, ¥ 5,000,00, 2021.11~2022.11.
- [4]. **PI**, National youth Scholar of China, ¥ 2,000,000, 2020-2025.
- [5]. **PI**, *Selective Motion Control of Hybrid Driven Micro-nano Robot for Targeted Therapy*, National Natural Science Foundation of China, Youth Project, Grant No. 61903177, ¥280,000, 2020.01~2022.12.
- [6]. **PI**, *Micro-nano robots for Targeted Drug Delivery to The Posterior Segment of The Eye*, Shenzhen Natural Science Foundation, Grant No. JCYJ20190809144013494, ¥400,000, 2020.05~2023.05.
- [7]. **PI**, *Artificial Bone Membrane Scaffold and Regulation of Cell Microenvironment Based On Hydrogel Electrodeposition Technology*, Guangdong Natural Science Foundation, General Project, ¥150,000, 2024-2026.
- [8]. **PI**, *Interfacial Characteristics of Micro-nano Robots and Tissues*, Guangdong Natural Science Foundation, General Project, Grant No. 2021A1515011813, ¥100,000, 2021.01~2023.12.
- [9]. **PI**, *Swarm Control of Micro-Nanorobots with External Fields for Targeted Therapy*, Stable Support Plan Program of Shenzhen Natural Science Fund, Grant

- No. 20220815104331001, ¥500,000, 2022.11~2024.09.
- [10].**PI**, *Self-Propelled Capsule Endoscope Robot*, Shenzhen Zifu Medical Technology Co., Ltd., ¥2000,000, 2024-2026.
- [11].**PI**, *Magnetic Capsule Endoscope*, SUSTech and Shenzhen Zifu Medical Joint Laboratory, ¥5,000,000, 2020.09~2025.09.
- [12].**PI**, *Motion Balance Algorithm of Exoskeleton Robot*, Wuxi MeiAn Rex Medical Robot Co., LTD, Grant No. OR2211009, ¥500,000, 2022.11~2024.11.
- [13].**PI**, *Development of Pepsin Detection Kit*, Mei An Innovative Medical Technology Wuxi Co., LTD, Grant No. OR2211010, ¥500,000, 2022.10~2024.10.
- [14].**PI**, *Development of Microneedle Patch*, Beijing Orange Technology Co., LTD, Grant No. OR2111014, ¥100,000, 2021.11~2022.04.
- [15].**PI**, *Teaching Reform of <Sensing Technology> Characterized By Internationalization, School-Enterprise Collaboration and Vertical Penetration, and The Integrated Teaching, Learning and Doing*, Southern University of Science and Technology, ¥ 40,000.
- [16].**Deputy Director**, *Key Laboratory of Human Body Augmentation and Rehabilitation Robots in General Universities of Guangdong Province*, Guangdong Provincial Department of Education, Grant No. 2020KSYS003, ¥ 1,000,000, 2021.10~2023.09.
- [17].**Core Member**, *Shenzhen Key Laboratory of Bionic Robots and Intelligent Systems*, Shenzhen Science and Technology Innovation Commission, Grant No. ZDSYS20200811143601004, ¥ 5,000,000, 2021.03~2023.03.
- [18].**Core Member**, *In-Depth Integration and Collaborative Training for Graduate Programs in Smart Manufacturing*, Department of Education in Guangdong Province, Grant No. 2021JKZG047, ¥ 50,000, 2022.06~2023.05.
- [19].**Core Member**, *Innovation Capability of Undergraduate Students in the Robotics Engineering Major Based on Integrated Talent Development*, Department of Education in Guangdong Province, Grant No. 2022GXJK318, ¥ 50,000, 2022.10~2024.09.

Grants before Joining SUSTech

- [1]. **PI**, *Manipulation of Magnetic Sugar Particles for Fabricating Flow Diverter Stent in Cerebral Aneurism Treatment*, Hori Financial Group of Japan, 500,000 JPY, 2012.
- [2]. **PI**, *3D Cell Assembly and Fabrication of Vascular Scaffolds for Regenerative*

Medicine, Young Researcher Budget of Nagoya University, 1,000,000 JPY, 2010-2013.

- [3]. **PI**, *Structured Porogen-based Fabrication of Vascular Scaffolds*, Young Researcher Budget of Nagoya University, 800,000 JPY, 2011.
- [4]. **Core Member**, *MecanX: Physics-Based Models of Growing Plant Cells using Multi-Scale Sensor Feedback*, Swiss Initiative for Systems Biology, CHF 1,940,000.00, 2013-2017.
- [5]. **Core Member**, *Mechanical Basis for the Convergent Evolution of Sensory Hairs in Animals and Plants*, SNF Interdisciplinary Grant, CHF 786,000.00, 2016-2019.

Publications

Journal Papers and Conference Papers

I have published more than 50 refereed journal articles, such as *Adv. Mater.*, *Adv. Funct. Mater.*, *Adv. Sci.*, *Small*, *Advanced Healthcare Materials*, *Nano Energy*, *ACS Nano*, *Lab Chip*, *Biofabrication*. These articles have been cited by more than 2400 (Google Scholar) with h-index of 22 (Google Scholar). I also have published more than 40 international conference papers, including 2 Best Paper Awards and more than 30 invited talks.

Journal Papers at SUSTech

* *Corresponding author*

These authors contributed equally to this work

Papers Submitted

- (1) X. He, L. Guo, Y. Hang, **C. Hu***, Rapid Photopatterning of ZnO Particles in a Large Scale Via Uv-Induced Charge Reversal and Chemical Bonding, *Nature Communications*, 2024, (Under Review).
- (2) Z. Li, T. Wei, Z. Xu, Y. Zhang, Q. Liu, C. Du, **C. Hu***, Rotating Multi-Barreled Capsule Robot for Multiple Biopsies and On-Demand Drug Delivery, *IEEE T. Bio-Med Eng.*, 2023, (Under Revision).
- (3) B. Zhang, Y. Cao, J. Guo, C. Shi, and **C. Hu**, A 6-D Electromagnetic Tracking System using Extremely Low-Frequency Electromagnetic Fields, *IEEE Transactions on Automation Science and Engineering*, 2024 (Under Review).

Papers Published

- (1) M. Yang, H. Xie, T. Jiang, M. Ye, Z. Zhan, Y. Zhang, X. Yan, X. Wang*, **C. Hu***,

- MXBOTS: Biodegradable MXene-Based Microrobots for Targeted Delivery and Synergistic Chemo-Photothermal Therapy, *ACS Materials Letters*, 2024
- (2) Y. Liu, D. Song, Q. Bu, Y. Dong, C. Hu*, C. Shi*, A Novel Electromagnetic Driving System for 5-DOF Manipulation in Intraocular Microsurgery, *Cyborg and Bionic Systems*, 2024.
 - (3) Z. Huang, Y. Li, T. Wei, D. Lu, C. Shi*, and C. Hu*, Enhanced Localization Strategy for Magnetic Capsule Robot Using On-Board Nine-Axis IMU Through Incorporation of Alternating Magnetic Field, *IEEE Transactions on Instrumentation & Measurement*, 2024.
 - (4) H. Xie, M. Yang, X. He, Z. Zhan, H. Jiang, Y. Ma, C. Hu*. Polydopamine-Modified 2D Iron (II) Immobilized MnPS₃ Nanosheets for Multimodal Imaging-Guided Cancer Synergistic Photothermal-Chemodynamic Therapy. *Advanced Science*, 2023.
 - (5) T. Wei, R. Zhao, L. Fang, Z. Li, M. Yang, Z. Zhan, U. Cheang, C. Hu*, Encoded Magnetization for Programmable Soft Miniature Machines by Covalent Assembly of Modularly Coupled Microgels, *Advanced Functional Materials*, 2023.
 - (6) J. Hao, J. Duan, K. Wang, C. Hu*, C. Shi*. Inverse Kinematic Modeling of the Tendon-Actuated Medical Continuum Manipulator Based on a Lightweight Timing Input Neural Network. *IEEE Transactions on Medical Robotics and Bionics*, 2023.
 - (7) H. Jiang, X. He, M. Yang, C. Hu*. Visible Light-Driven Micromotors in Fuel-Free Environment with Promoted Ion Tolerance. *Nanomaterials*, 2023
 - (8) Y. Zhou, M. Ye, C. Hu, H. Qian, B. J. Nelson*, X. Wang*. Stimuli-responsive Functional Micro-/Nanorobots: a Review, *ACS nano*, 2023
 - (9) Y. Li, Z. Huang, X. Liu, J. Jie, C. Song, C. Hu*. Calibrated Analytical Model For Magnetic Localization of Wireless Capsule Endoscope Based on Onboard Sensing. *Robotica*, 2023.
 - (10) J. Hao, D. Song, C. Hu*, C. Shi*. Two-Dimensional Shape and Distal Force Estimation for the Continuum Robot Based on Learning from the Proximal Sensors, *IEEE Sensors Journal*, 2023.
 - (11) Z. Liu, H. Nan, Y. S. Chiou, Z. Zhan, P. E. Lobie, C. Hu*. Selective Formation of Osteogenic and Vasculogenic Tissues for Cartilage Regeneration. *Advanced Healthcare Materials*, 2023.
 - (12) B. Fu, J. Li, H. Jiang, X. He, Y. Ma, J. Wang, C. Shi, C. Hu*. Enhanced Piezotronics by Single-Crystalline Ferroelectrics for Uniformly Strengthening the Piezo-Photocatalysis of Electrospun BaTiO₃@TiO₂ Nanofibers. *Nanoscale*, 2022.

- (13) S. Balachandran, R. Karthikeyan, K. J. Jothi, V. Manimuthu, N. Prakash, Z. Chen, T. Liang, **C. Hu***, Feng Wang*, M. Yang*. Fabrication of Flower-Like Bismuth Vanadate Hierarchical Spheres for an Improved Supercapacitor Efficiency. *Materials Advances*, 2022, 3(1): 254-264.
- (14) J. Li, X He, H Jiang, Y Xing, B Fu, **C Hu***. Enhanced and Robust Directional Propulsion of Light-Activated Janus Micromotors by Magnetic Spinning and the Magnus Effect. *ACS Applied Materials & Interfaces*, 2022.
- (15) W. Hu, Y. Ma, Z. Zhan, D. Hussain, **C. Hu***. Robotic Intracellular Electrochemical Sensing for Adherent Cells. *Cyborg and Bionic Systems*, 2022.
- (16) Y. Xing, D. Hussain, **C. Hu***. Optimized Dynamic Motion Performance for a 5-Dof Electromagnetic Manipulation. *IEEE Robotics and Automation Letters*, 2022.
- (17) Z. Zhan, Z. Liu, H. Nan, J. Li, Y. Xie, **C. Hu***. Heterogeneous Spheroids with Tunable Interior Morphologies by Droplet-Based Microfluidics. *Biofabrication*, 2022.
- (18) B. Fu, J. Li, H. Jiang, X. He, Y. Ma, J. Wang, **C. Hu***. Modulation of Electric Dipoles Inside Electrospun $\text{BaTiO}_3/\text{TiO}_2$ Core-Shell Nanofibers for Enhanced Piezo-Photocatalytic Degradation of Organic Pollutants. *Nano Energy*, 2022.
- (19) Q. Fu, H. Feng, L. Liu, Z. Li, J. Li, J. Hu, **C. Hu**, X. Yan, H. Yang, J. Song. Spatiotemporally Controlled Formation and Rotation of Magnetic Nanochains in Vivo for Precise Mechanotherapy of Tumors. *Angewandte Chemie International Edition*, 2022, 61(51): e202213319.
- (20) Z. Liu, H. Nan, Y. Jiang, T. Xu, X. Gong, **C. Hu***. Programmable Electrodeposition of Janus Alginate/Poly-L-Lysine/ Alginate (APA) Microcapsules for High-Resolution Cell Patterning and Compartmentalization. *Small*, 2021.
- (21) D. Xu, W. Hu, Y. Jia, **C. Hu***. An Immersed Boundary-Lattice Boltzmann Method for Hydrodynamic Propulsion of Helical Microrobots at Low Reynolds Numbers. *IEEE Robotics and Automation Letters*, 2021.
- (22) H. Jiang, X. He, Y. Ma, X. Xu, B. Subramanian, **C. Hu***. Isotropic Hedgehog-Shaped- TiO_2 / Functional-Multiwall-Carbon-Nanotube Micromotors with Phototactic Motility in Fuel-Free Environments. *ACS Applied Materials & Interfaces*, 2021.
- (23) X. He, H. Jiang, J. Li, Y. Ma, B. Fu, **C. Hu***. Dipole-Moment Induced Phototaxis and Fuel-Free Propulsion of ZnO/Pt Janus Micromotors. *Small*, 2021.
- (24) Z. Liu, H. Zhang, Z. Zhan, H. Nan, N. Huang, Tao Xu, X. Gong, **C. Hu***. Mild Formation of Core-Shell Hydrogel Microcapsules for Cell Encapsulation. *Biofabrication*, 2021.

- (25) X. Wang, C. **Hu***, B. J. Nelson*, Dynamic Modeling of Magnetic Helical Microrobots, *IEEE Robotics and Automation Letters (RA-L)*, 2021.
- (26) B. Subramanian, M. Veerappan, K. Rajan, Z. Chen, C. **Hu***, F. Wang, F. Wang, M. Yang. Fabrication of Hierarchical Indium Vanadate Materials for Supercapacitor Application. *Global Challenges*, 2020.
- (27) S. Qin, H. Li, C. **Hu***. Thermal Properties and Morphology of Chitosan/Gelatin Composite Shell Microcapsule Via Multi-Emulsion. *Materials Letters*, 2021.
- (28) Z. Li , Z. Chen, Y. Gao, Y. Xing, Y. Zhou, Y. Luo, W. Xu, Z. Chen, X. Gao, K. Gupta, K. Anbalakan, L.Chen, C. Liu, J. Kong, H. L. Leo, C. **Hu**, H. Yu, Q. Guo. Shape Memory Micro-Anchors with Magnetic Guidance for Precision Micro-Vascular Deployment. *Biomaterials*, 2022, 283: 121426.

Journal Papers before joining SUSTech

- (1) X. Wang, C. **Hu***, L. Schurz, C. De Marco, X. Z. Chen, S. Pane, B. J. Nelson. Surface-Chemistry-Mediated Control of Individual Magnetic Helical Microswimmers in a Swarm. *ACS Nano*, 2018.
- (2) C. **Hu**, S. Pane, B.J. Nelson, Soft Micro-and Nanorobotics. *Annual Review of Control, Robotics, and Autonomous Systems*, 2018, 1: 53-75.
- (3) C. **Hu**, F. Aeschlimann, G. Chatzipirpirdis, J. Pokki, X. Chen, J. Puigmarti-Luisb, B. J. Nelson, S. Pané, Spatiotemporally Controlled Electrodeposition of Magnetically Driven Micromachines Based on the Inverse Opal Architecture. *Electrochemistry Communications*, 2017, 81: 97-101.
- (4) C. **Hu**, G. Munglani, H. Vogler, T. Ndinyanka Fabrice, N. Shamsudhin, F. K. Wittel, C. Ringli, U. Grossniklaus, H. J. Herrmann, B. J. Nelson, Characterization of Size-Dependent Mechanical Properties of Tip-Growing Cells Using a Lab-On-Chip Device. *Lab on a Chip*, 2017, 17(1): 82-90. Front Outside Cover.
- (5) C. **Hu**, H. Vogler, M. Aellen, N. Shamsudhin, B. Jang, U. Grossniklaus and B. J. Nelson, High Precision, Localized Proton Gradients and Fluxes Generated by a Microelectrode Device Induce Differential Growth Behaviors of Pollen Tubes. *Lab on a Chip*, 2017, 17(4): 671-680.
- (6) C. **Hu**, Q. Shi, L. Liu, U. Wejinya, Y. Hasegawa, Y. Shen, Robotics in Biomedical and Healthcare Engineering, *Journal of Healthcare Engineering*, 2017: 1610372.
- (7) C. **Hu**, M. Nakajima, T. Yue, M. Takeuchi, M. Seki, Q. Huang and T. Fukuda, On-Chip Fabrication of Magnetic Alginate Hydrogel Microfibers by Multi-Layered Pneumatic Microvalves. *Microfluidics and nanofluidics*, 2014, 17: 457-468.
- (8) C. **Hu**, C. Tercero, S. Ikeda, M. Nakajima, H. Tajima, Y. Shen, T. Fukuda, and F. Arai, Biodegradable Porous Sheet-Like Scaffolds for Soft-Tissue Engineering

- Using a Combined Particulate Leaching of Salt Particles and Magnetic Sugar Particles, *Journal of Bioscience and Bioengineering*, vol. 116, pp. 126-131, 2013.
- (9) C. Hu, T. Uchida, C. Tercero, S. Ikeda, K. Ooe, T. Fukuda, F. Arai, M. Negoro, and G. Kwon, Development of Biodegradable Scaffolds Based on Magnetically Guided Assembly of Magnetic Sugar Particles, *Journal of Biotechnology*, vol. 159, pp. 90-98, 2012.
- (10) M. Gao, C. Hu, Z. Chen, H. Zhang, and S. Liu, Design and Fabrication of a Magnetic Propulsion System for Self-propelled Capsule Endoscope, *IEEE Transactions on Biomedical Engineering*, vol. 57, pp. 2891-2902, 2010. Co-first author. Front Cover.
- (11) Z. Yang, C. Y. Gu, T. Chen, C. Hu*, and L. N. Sun*, Kink and Delta Self-Actuating Platinum Micro-Robot, *IEEE Transactions on Nanotechnology*, vol. 17, no. 3, pp. 603-606, 2018.
- (12) N. Shamsudhin, N. Laebli, H.B. Atakan, H. Vogler, C. Hu*, W. Haeberle, A. Sebastian, U. Grossniklaus and B.J. Nelson, Massively Parallelized Pollen Tube Guidance and Mechanical Measurements on a Lab-On-A-Chip Platform, *PLoS ONE*, 11(12): e0168138. 2016.
- (13) X.-Z. Chen, J.-H. Liu, M. Dong, L. Müller, G. Chatzipirpiridis, C. Hu, A. Terzopoulou, H. Torlakcik, X. Wang, F. Mushtaq, J. Puigmartí-Luis, Q.-D. Shen, B. J. Nelson, and S. Pané, Magnetically Driven Piezoelectric Soft Microswimmers for Neuron-Like Cell Delivery and Neuronal Differentiation. *Materials Horizons*, 2019, 6(7): 1512-1516.
- (14) X. Wang, X.-Z. Chen, C. C. J. Alcântara, S. Sevim, M. Hoop, A. Terzopoulou, C. de Marco, C. Hu, A. J. de Mello, P. Falcaro, S. Furukawa, B. J. Nelson, J. Puigmartí-Luis, and S. Pané, MOFBOTS: Metal-Organic-Framework-Based Biomedical Microrobots, *Advanced Materials*, 2019, 31(27): 1901592.
- (15) J. T. Burri, H. Vogler, N. F. Laubli, C. Hu, U. Grossniklaus, and B. J. Nelson, Feeling the Force: How Pollen Tubes Deal with Obstacles, *New Phytologist*, vol. 220, no. 1, pp. 187-195, 2018.
- (16) X. Wang, X.-H. Qin, C. Hu, A. Terzopoulou, X.-Z. Chen, T.-Y. Huang, K. Maniura-Weber, S. Pané and B. J. Nelson. 3D Printed Enzymatically Biodegradable Soft Helical Microswimmers. *Advanced Functional Materials* 28(45): 1804107. 2018.
- (17) X. Chen, B. Jang, D. Ahmed, C. Hu, C. De Marco, M. Hoop, F. Mushtaq, B. J. Nelson, S. Pane, Small-Scale Machines Driven by External Power Sources, *Advanced Materials*, 2018.
- (18) T. Sun, Q. Shi, Q. Huang, H. Wang, X. Xiong, C. Hu, and T. Fukuda, Magnetic Alginate Microfibers As Scaffolding Elements for the Fabrication of

- Microvascular-Like Structures. *Acta biomaterialia*, 2018, 66: 272-281.
- (19) X. Z. Chen, M. Hoop, F. Mushtaq, E. Siringil, **C. Hu**, BJ Nelson, S Pané, Recent Developments in Magnetically Driven Micro-and Nanorobots, *Applied Materials Today*, vol. 9, pp. 37-48, 2017.
- (20) W. Shang, Y. Liu, W. Wan, **C. Hu**, Z. Liu, CT Wong, T Fukuda, Y Shen, Hybrid 3D Printing and Electrodeposition Approach for Controllable 3D Alginate Hydrogel Formation, *Biofabrication*, vol. 9, pp. 025032, 2017.
- (21) B. J. Jang, W. Wang, S. Wiget, A. J. Petruska, X. Z. Chen, **C. Hu**, A. Y. Hong, D. Folio, A. Ferreira, S. Pane, and B. J. Nelson, Catalytic Locomotion of Core-Shell Nanowire Motors, *ACS Nano*, vol. 10, pp. 9983-9991, Nov 2016.
- (22) Z. Liu, M. Takeuchi, M. Nakajima, **C. Hu**, Y. Hasegawa, Q. Huang, et al., Three-Dimensional Hepatic Lobule-Like Tissue Constructs Using Cell-Microcapsule Technology, *Acta Biomaterialia*, vol. 50, pp. 178-187, 2016.
- (23) T. Sun, Q. Huang, Q. Shi, H. P. Wang, **C. Hu**, P. Y. Li, M. Nakajima, and T. Fukuda, Assembly of Alginate Microfibers to Form a Helical Structure Using Micromanipulation with a Magnetic Field, *Journal of Micromechanics and Microengineering*, vol. 26, 105017, Oct 2016.
- (24) T. Sun, **C. Hu**, M. Nakajima, M. Takeuchi, M. Seki, T. Yue, Q. Shi, T. Fukuda, and Q. Huang, On-Chip Fabrication and Magnetic Force Estimation of Peapod-Like Hybrid Microfibers Using a Microfluidic Device, *Microfluidics and Nanofluidics*, vol. 18, pp. 1177-1187, May 2015.
- (25) T. Yue, M. Nakajima, M. Takeuchi, **C. Hu**, Q. Huang, and T. Fukuda, On-Chip Self-Assembly of Cell Embedded Microstructures to Vascular-Like Microtubes, *Lab on a Chip*, vol. 14, pp. 1151-1161, 2014.
- (26) A. Bakar, M. Nakajima, **C. Hu**, H. Tajima, S. Maruyama, and T. Fukuda, Fabrication of 3D Photoresist Structure for Artificial Capillary Blood Vessel, *Journal of Robotics and Mechatronics*, Vol.25, No.4, pp. 673-681, 2013
- (27) M. Gao, **C. Hu**, Z. Chen, S. Liu, and H. Zhang, Finite-Difference Modeling of Micromachine for Use in Gastrointestinal Endoscopy, *IEEE Transactions on Biomedical Engineering*, vol. 56, pp. 2413-2419, 2009.

Peer-reviewed Conference Publications

Conference Papers at SUSTech

- (1) S. He, Y. Zhang, B. Huang, J. Lin, **C. Hu***, A Track-Based Colon Endoscopic

- Robot with Depth Perception Stereo Cameras for Haustral Fold Detection During Colonic Navigation, *IEEE International Conference on Robotics and Automation (ICRA)*, 2024, (Accepted).
- (2) Y. Zhang, T. Wei, S. He, Y. Hong, **C. Hu***, Development of a Vibration-driven Capsule Robot with Protruding Magnetic Bristles with Enhanced Adaptability in Wet and Dry Environments, *IEEE Conference on Robotics and Biomimetics (ROBIO)*, 2023.
 - (3) Y. Zhang, W. Wang, W. Ke and **C. Hu***, Optimized Design and Analysis of Active Propeller-driven Capsule Endoscopic Robot for Gastric Examination, *IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
 - (4) Z. Xu, T. Wei, Z. Li, D. Huang, S. Liu*, **C Hu***, Magnetically Driven Capsule Robot for Multi-Targeted Biopsy and Drug Delivery in Stomach, *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2023.
 - (5) Z. Xu, Z. Li, S. Liu, **C. Hu***. Design of Capsule Robot for Magnetic Gastric Biopsy and Drug Administration, *2023 IEEE International Conference on Mechatronics and Automation (ICMA)*, 2023: 2297-2302.
 - (6) M. Ruan, W. Hu, Y. Ma, Z. Zhan, **C. Hu***. Automated Electrowetting-Based Nanobiopsy System for Adherent Cells, *IEEE International Conference on Mechatronics and Automation (ICMA)*, 2023: 2442-2447.
 - (7) Z. Zhan, Z. Liu, J. Li, W. Zhang, **C. Hu***, Droplet-based Microfluidic Synthesis of Functional Vascularized Hydrogel Microspheres. *The 26th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2022)*, Hangzhou, China, 2022.
 - (8) Z. Zhan, H. Xie, **C. Hu***, Droplet-based Microfluidic Platform for Highthroughput Formation of Multicellular Spheroids. *2023 International Conference on Manipulation, Manufacturing, and Measurement on the Nanoscale (2023 3M-NANO)*, Chengdu, China, 2023.
 - (9) Y. Ma, W. Hu, M. Ruan, Z. Zhan, Y. Zhang, **C. Hu***, Electrochemical Monitoring of Intracellular Reactive Oxygen Species Based on Automated Nanoprobe Platform. *2023 International Conference on Manipulation, Manufacturing, and Measurement on the Nanoscale (2023 3M-NANO)*, Chengdu, China, 2023.
 - (10) W. Wang, Y. Zhang, **C. Hu***. Modeling and Experimental Characterization of Propeller-driven Capsule Endoscope Robot for Gastrointestinal Minimally Invasive Diagnosis, *IEEE International Conference on Cyborg and Bionic Systems (CBS)*, 2023: 7-12.
 - (11) Y. Zhang, Z. Li, W. Ke, **C. Hu***. Development of a Compact Autonomous Propeller-Driven Capsule Robot for Noninvasive Gastric Endoscopic Examination,

- IEEE International Conference on Cyborg and Bionic Systems (CBS)*, 2023: 1-6.
- (12) Y. Luo, X. Zhu, Y. Zhou, L. You, Z. Xu, Y. Wei, W. Ke, **C. Hu***. Development of Autonomous Underwater Robot for Navigation through Narrow Passages, *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2022: 2207-2212.
- (13) Y. Tang, Y. Xing, Y. Li, **C. Hu***. Collision-Free Navigation of Magnetic Mobile Microrobot in Multiple Scenarios, *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2022: 223-228.
- (14) Z. Huang, **C. Hu***, Real-Time Attitude Tracking of Capsule Endoscope Based on MEMS IMU and Error Analysis, *2021 IEEE International Conference on Real-time Computing and Robotics (RCAR)*, 2021: 968-973.
- (15) Y. Xing, Y. Jia, Z. Zhan, J. Li and **C. Hu***, A Flexible Magnetic Field Mapping Model for Calibration of Magnetic Manipulation System, *IEEE International Conference on Robotics and Automation (ICRA 2021)*, pp. 7281-7287.
- (16) W. Hu, H. Liang, J. Li, Y. Xing, Z. Zhan, Y. Zhang. **C. Hu***, Three-Dimensional Positioning of the Micropipette for Intracytoplasmic Sperm Injection, *2021 IEEE International Conference on Robotics and Automation (ICRA 2021)*, 2021, pp. 1249-1255.
- (17) H. Nan, Z. Liu, **C. Hu***, Electrosynthesis of Janus Alginate Hydrogel Microcapsules with Programmable Shapes for Cell Encapsulation, *2019 IEEE 19th International Conference on Nanotechnology (IEEE-NANO)*, 412-416
- (18) J. Niu, Z. Liu, H. Zhang, **C. Hu***, Electrodeposition of Magnetic Alginate-Poly-L-Lysine Microcapsules for Targeted Drug Delivery. *Annual IEEE International Conference on Nano/Micro Engineered and Molecular Systems*, 2019; pp 403-408.
- (19) H. Zhang, Z. Liu, H. Nan, **C. Hu***, IEEE, Development of Retina Cell-Laden Alginate Microbeads for Study of Glaucoma. *Annual IEEE International Conference on Nano/Micro Engineered and Molecular Systems*, 2019; pp 143-148.

Conference Papers before joining SUSTech

- (1) **C. Hu**, Q. Zhang, T. Meyer, H. Vogler, J. Burri, N. Shamsudhin, U. Grossniklaus, B. J. Nelson. In Vivo Tracking and Measurement of Pollen Tube Vesicle Motion, *IEEE International Conference on Robotics and Automation (ICRA)*, 2017: 3575-3580.
- (2) **C. Hu**, K. Riederer, M. Klemmer, S. Pane, and B. J. Nelson, Electrosynthesis of Magneto-responsive Microrobot for Targeted Drug Delivery Using Calcium Alginate, *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2016, pp. 2111-2114.

- (3) **C. Hu**, M. Nakajima, T. Yue, Y. J. Shen, T. Fukuda, F. Arai, and M. Seki, Controlled Patterning of Magnetic Hydrogel Microfibers under Magnetic Tweezers, *IEEE International Conference on Intelligent Robots and Systems (IROS)*, pp. 2059-2064, 2013.
- (4) **C. Hu**, M. Nakajima, T. Yue, M. Takeuchi, M. Seki, and T. Fukuda, Preparation and Characterization of Magnetic PEGDA Beads for Enhanced Construction of Hydrogel Assembly, *2013 International Symposium on Micro-Nanomechatronics and Human Science (MHS)*, 2013.
- (5) **C. Hu**, M. Nakajima, H. Wang, T. Yue, Y. Shen, M. Takeuchi, Q. Huang, M. Seki, and T. Fukuda, Magnetic Manipulation for Spatially Patterned Alginate Hydrogel Microfibers, *13th IEEE International Conference on Nanotechnology (IEEE-NANO 2013)*, 2013, pp. 529-534.
- (6) **C. Hu**, C. Tercero, S. Ikeda, T. Fukuda, M. Nakajima, F. Arai, and M. Negoro, Magnetic Sugar Particles for Particulate Leaching in Fabrication of Sheet-Like Scaffold, in *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2012, pp. 3229-3234.
- (7) **C. Hu**, M. Nakajima, T. Yue, Y. Shen, and T. Fukuda, Fabrication and Evaluation of Magnetic Hydrogel Fiber Based on Microfluidic Device, in *2012 International Symposium on Micro-NanoMechatronics and Human Science (MHS)*, 2012, pp. 393-398.
- (8) **C. Hu**, C. Tercero, S. Ikeda, T. Fukuda, F. Arai, and M. Negoro, Modeling and Design of Magnetic Sugar Particles Manipulation System for Fabrication of Vascular Scaffold, *2011 IEEE/Rsj International Conference on Intelligent Robots and Systems*, pp. 439-444, 2011.
- (9) **C. Hu**, C. Tercero, S. Ikeda, T. Fukuda, F. Arai, and M. Negoro, Magnetically-Guided Assembly of Magnetic Sugar Particles for Biodegradable Scaffolds, in *SICE Annual Conference 2011*, 2011, pp. 1621-1626.
- (10) **C. Hu**, C. Tercero, S. Ikeda, K. Ooe, T. Fukuda, F. Arai, K. Isobe, and M. Negoro, Cytocompatibility Evaluation of Ferrite and NdFeB Magnetic Sugar Particles for Vasculature Scaffold Fabrication, *International Symposium on Micro-NanoMechatronics and Human Science*, 2011, pp. 228-233.
- (11) **C. Hu**, M. Gao, Z. Chen, H. Zhang, S. Liu. Magnetic Analysis and Simulations of a Self-Propelled Capsule Endoscope, *2010 11th International Thermal, Mechanical & Multi-Physics Simulation, and Experiments in Microelectronics and Microsystems (EuroSimE)*, 2010: 1-5.
- (12) **C. Hu**, M. Gao, Z. Chen, H. Zhang, S. Liu. Novel Magnetic Propulsion System for Capsule Endoscopy, *ASME International Mechanical Engineering Congress and*

- Exposition*. 2009, 43758: 361-366.
- (13) T. Sun, Q. Shi, H. Wang, X. Liu, **C. Hu**, M. Nakajima, Q. Huang, Toshio Fukuda. Robotics-based Micro-reeling of Magnetic Microfibers to Fabricate Helical Structure for Smooth Muscle Cell Culture, *2017 IEEE International Conference on Robotics and Automation (ICRA)*, 2017: 5983-5988.
- (14) J. T. Burri, **C. Hu**, N. Shamsudhin, X. Wang, H. Vogler, U. Grossniklaus, B. J. Nelson. Dual-Axis Cellular Force Microscope for Mechanical Characterization of Living Plant Cells, *2016 IEEE International Conference on Automation Science and Engineering (CASE)*, 2016: 942-947.
- (15) N. Shamsudhin, H. B. Atakan, N. Läubli, H. Vogler, **C. Hu**, A. Sebastian, U. Grossniklaus, B. J. Nelson. Probing the Micromechanics of the Fastest Growing Plant Cell-The Pollen Tube, *2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2016: 461-464.
- (16) T. Yue, M. Nakajima, **C. Hu**, M. Takeuchi, T. Fukuda. Fluidic Assembly of Multilayered Tubular Microstructures Inside 2-Layered Microfluidic Devices, *MHS 2013*, 2013: 1-4.
- (17) M. Nakajima, M. Takeuchi, Y. Tao, **C. Hu**, N. Takei, M. Yamada, M. Seki, T. Fukuda. Assembly Techniques for Artificial Small Diameter Blood Vessel Structures, *2013 IEEE International Conference on Mechatronics and Automation*. 2013: 273-278.
- (18) H. Wang, M. Nakajima, T. Yue, **C. Hu**, M. Takeuchi, Q. Huang, T. Fukuda. Dexterous Stick Coordination Manipulation for 3D Hydrogel Assembly by Dual-Nanomanipulator, *13th IEEE International Conference on Nanotechnology (IEEE-NANO 2013)*, 2013: 207-212.
- (19) T. Yue, M. Nakajima, H. Wang, **C. Hu**, M. Takeuchi, Q. Huang, T. Fukuda. Fabrication of Multilayered Tube-Shaped Microstructures Embedding Cells Inside Microfluidic Devices, *2013 13th IEEE International Conference on Nanotechnology (IEEE-NANO 2013)*, 2013: 539-544.
- (20) A. A. Bakar, M. Nakajima, T. Yue, **C. Hu**, M. Takeuchi, S. Maruyama, T. Fukuda. Fabrication of 3D Porous Micro-Channel for Artificial Capillary Blood Vessel Model, *The SICE Annual Conference 2013*, 2013: 2661-2666.
- (21) T. Yue, M. Nakajima, H. Wang, **C. Hu**, M. Takeuchi, T. Fukuda. Fabrication and Assembly of Multi-layered Microstructures Embedding Cells Inside Microfluidic Devices, *2013 IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2013: 514-519.
- (22) A. Abu Bakar, M. Nakajima, T. Yue, **C. Hu**, M. Takeuchi, S. Maruyama, T. Fukuda. Micro-sorting Device by a Micro-channel with Multiple-size Pores, *MHS2013*,

2013: 1-4.

- (23) Y. Shen, M. Nakajima, **C. Hu**, T. Yue, H. Tajima, T. Fukuda. 3D Cell Assembly Based on Electrodeposition of Calcium Alginate, *2012 International Symposium on Micro-NanoMechatronics and Human Science (MHS)*, 2012: 249-252.
- (24) T. Yue, M. Nakajima, **C. Hu**, Y. Shen, H. Tajima, T. Fukuda. Fabrication and Self-Assembly of Movable Microstructures Embedding Cells with Concentration Control Inside Microfluidic Devices, *2012 International Symposium on Micro-NanoMechatronics and Human Science (MHS)*, 2012: 169-174.
- (25) M. Gao, **C. Hu**, Z. Chen, H. Zhang, S. Liu. Magnetic Controlled Navigation System for Endoscopic Micro Robot, *2009 IEEE 3rd International Conference on Nano/Molecular Medicine and Engineering*, 2009: 24-27.

Patents

- (1) **C. Hu**, Z. Huang, Y. Li, Flexible electrode and its preparation method and application, sensor, China Invention Patent, Application number: 202310140824.8, 2023.02.15.
- (2) **C. Hu**, Y. Tang, Microgel assembly method, China Invention Patent, Application number: 202310731414.0, 2023.06.19.
- (3) **C. Hu**, X. He, H. Jiang, Z. Xv, Patterning method of ZnO micro/nanoparticles, patterned ZnO film and its applications, China Invention Patent, Application number: 202310975139.7, 2023.08.03.
- (4) **C. Hu**, Y. Zhang, Capsule robot, testing system and method for miniature motor of capsule robot, China Invention Patent, Application number: 202311289107.8, 2023.09.27.
- (5) **C. Hu**, Y. Zhang, A capsule robot, China Utility Model Patent, Application number: 202322635303.8, 2023.09.27.
- (6) **C. Hu**, Z. Li, Capsule robot and capsule robot system, China Invention Patent, Application number: 202311287787.X, 2023.10.07.
- (7) **C. Hu**, B. Zhang, An electromagnetic positioning method and system, China Invention Patent, Application number: 202311534055.6, 2023.11.16.
- (8) **C. Hu**, T. Wei, Magnetic capsule and its preparation method, operation method, China Invention Patent, Application number: 202311693358.2, 2023.12.09.
- (9) **C. Hu**, A. Xie, Microfluidic chip fixture and microfluidic experimental device, China Invention Patent, Application number: 202111322709.X, 2021.11.09.
- (10) **C. Hu**, A. Xie, Microfluidic chip fixture and microfluidic experimental device,

- China Utility Model Patent, Application number: 202122739657.8, 2021.11.09. (Authorized)
- (11) **C. Hu**, Z. Li, Digestive tract robots, China Invention Patent, Application number: 202310370638.3, 2023.03.28.
- (12) **C. Hu**, Z. Li, Digestive tract robots, China Utility Model Patent, Application number: 202320703259.7, 2023.03.28. (Authorized)
- (13) **C. Hu**, Z. Xv, Z. Li, Capsule robot, China Invention Patent, Application number: 202310276973.7, 2023.03.10.
- (14) **C. Hu**, Z. Xv, Z. Li, Capsule robot, China Utility Model Patent, Application number: 202320524364.4, 2023.03.10. (Authorized)
- (15) **C. Hu**, Z. Li, K. Chen, Capsule robot, China Utility Model Patent, Application number: 202223610294.9, 2022.12.30. (Authorized)
- (16) **C. Hu**, Y. Jia, Y. Xing, A magnetic field generation system, China Invention Patent, Application number: 202010342765.9, 2020.04.26. (Authorized)
- (17) **C. Hu**, Y. Zhang, Capsule robot module and capsule robot combination, China Utility Model Patent, Application number: 202121250938.0, 2021.12.24. (Authorized)
- (18) **C. Hu**, B. Fu, A composite piezoelectric photocatalyst that can be coated on the surface of magnetic micro-robot and its preparation method and application, China Invention Patent, Application number: 202110756766.2, 2021.07.05.
- (19) **C. Hu**, Z. Li, Z. Xv, Capsule endoscopic robot, China Invention Patent, Application number: 202211251294.6, 2022.10.13.
- (20) **C. Hu**, Z. Xv, Z. Li, Drug dispensing mechanism and capsule robot, China Utility Model Patent, Application number: 202222692993.6, 2022.10.13. (Authorized)
- (21) **C. Hu**, W. Hu, Y. Ma, M. Ruan, Automatic intracellular electrochemical detection method, system, apparatus and storage medium, China Invention Patent, Application number: 202310355508.2, 2023.03.22. (Authorized)
- (22) **C. Hu**, Z. Hu, Attitude measurement method, device and terminal equipment for capsule endoscope, China Invention Patent, Application number: 202310161339.9, 2023.02.14.
- (23) **C. Hu**, X. Zhu, Y. Luo, The robot and its shell, China Utility Model Patent, Application number: 202320980638.0, 2023.04.19. (Authorized)
- (24) **C. Hu**, S. He, Y. Zhang, B. Huang, Colonoscopy robot based on crawler drive structure, China Utility Model Patent, Application number: 202321730792.9, 2023.07.03.

- (25) S. Liu, Z. Chen, M. Gao and **C. Hu**, Magnetically Guided Motion Control System used for Detecting Capsule Endoscope, China Patent CN101732026A, **2010**.
- (26) S. Liu, Y. Ming, M. Gao, **C. Hu** and X. Zhang, Design of Capsule Endoscope based on Flexible Printed Circuit Board, China Patent CN201431440, **2010**.
- (27) S. Liu, M. Gao, **C. Hu**, and Y. Ming, Interconnected Structure Processing of Through-Silicon-Vias, China Patent CN101483150, **2009**.
- (28) S. Liu, M. Gao, **C. Hu**, and Y. Ming, Three-Dimensional Silicon Through-Vias Interlinkage Structure Manufacturing Method, CN101483149, **2009**.

Selected Invited Lectures and Presentations

- (1) Invited talk, Chinese Society of Micro and Nano Technology, **2023**;
- (2) Invited talk, 2023 International Conference on Mechatronics and Automation, **2023** IEEE ICMA;
- (3) Invited talk, 2023 China Intelligent Robot Academic Annual Conference, **2023** CIRAC;
- (4) Invited talk, Annual Conference for Society of Chinese Mechanical Engineering Biomanufacturing Division and International Symposium on Bio-Manufacturing, ACBD-ISBM **2023**;
- (5) Invited talk, 2022 China Intelligent Robot Academic Annual Conference, **2022** CIRAC;
- (6) Invited talk, 2022 IEEE International Conference on Advanced Robotics and Mechatronics;
- (7) Invited talk, **2021** Micro Nano Fluidics for Active Health Conference;
- (8) Invited talk, **2021** Four Seasons Youth Forum;
- (9) Invited talk, 2021 IEEE International Conference on Robotics and Automation, **2021**;
- (10) Invited talk, 2021 IEEE International Conference on Real-time Computing and Robotics, **2021** IEEE RCAR;
- (11) Invited talk, SUSTech-MIT Conference;
- (12) Invited lecture, Soochow University, **2021**;
- (13) Invited lecture, Shanghai University, **2021**;
- (14) Invited talk, Micro-Nano Technology and Healthcare Innovation Conference **2020**;
- (15) Invited talk, Harbin Institute of Technology Micro-Nano Motor Youth Forum, **2020**;

- (16) Invited talk, Microfluidic Technology Application Innovation Conference **2020**;
- (17) Invited talk, **2019-2022** Annual Conference of Micro-Nano Robotics Branch of China Micro-Nano Society;
- (18) Invited talk at the annual meeting of the Society of Micro and Nanotechnology, **2018-2021**;
- (19) Invited talk, Beijing Institute of Technology, **2019**;
- (20) Invited talk at the 16th Emerging Technology Exchange Conference of Shenzhen High-tech Industrial Park in 2021
- (21) Invited talk at AIM 2019, Hong Kong. **2019**;
- (22) Invited talk at the IEEE CBS Conference, Shenzhen, **2018.10**;
- (23) Invited talk, Seminar for Cyborg and Bionic Systems, Beijing, **2018**;
- (24) Invited talk at Shenzhen University, **2018.10**;
- (25) Invited talk, Micro-Nano Robotics Branch of the Annual Meeting of the Chinese Micro-Nano Society **2018**;
- (26) Invited talk, Active Matter Forum, **2018**;
- (27) Invited Talk, SystemsX.ch Conferences, Zurich, **2017**;
- (28) Microrobotics for quantitating the growth mechanics of plant cells, IEEE Nano, Pittsburgh, **2017**;
- (29) Invited Talk, City University of Hong Kong, **2017**;
- (30) Invited Talk, Huazhong University of Science and Technology, **2017**;
- (31) Invited Talk, SysemX.ch Day, Bern, **2016**;
- (32) Invited Talk, Max Planck ETH Workshop on Learning Control, Tübingen. **2015**;
- (33) Invited Talk, Italian Institute of Technology, **2015**.
- (34) Invited Talk, SystemsX.ch Conferences, Lausanne. **2014**;
- (35) Satellite symposium of 23rd IEEE International Symposium on Micro-Nano Mechatronics and Human Science, Nagoya, Japan. **2012**;

TEACHING AND CURRICULUM DEVELOPMENT

Teaching Courses

Since joining SUSTech in June 2018, I have taught courses for ME335 Microfabrication and Microsystems, ME425 Sensing Technology, ME321 Sensors and

Actuators. In total, there are 9 courses.

Mainly including:

- **Microfabrication and Microsystems** (Major Elective Courses for senior undergraduate students and graduate students, 48 class hours/semester, evaluation of teaching: 96.4/100)
- **Sensing Technology** (Major Elective Course for undergraduate students, 32 class hours/semester and 32 lab hours/semester, evaluation of teaching: 84.5/100)
- **Sensors and Actuators** (Major Core Courses for undergraduate students, 40 class hours/semester and 16 lab hours/semester, evaluation of teaching: 100/100)
- **Industrial Internship**
- **Graduation Project**

Curriculum Development

New courses developed at SUSTech

- **ME335 Microfabrication and Microsystems**
- **ME425 Sensing Technology**
- **ME321 Sensors & Actuators**

ADVISING AND MENTORING

Undergraduate Student Activities

From 2018-2023, I supervised 21 undergraduate students as their Academic Advisor and 18 undergraduate students from Zhiren College of SUSTech as their Life Mentor. The projects are from my lab or collaboratively supervised by MicroPort Medical Co. Ltd, Jifu Medical Co. Ltd, Move Smarter Robot Co., Ltd., Max Health Medical Group China, etc.

- Supervise undergraduate student **Shujing He** to study colon endoscopic robots. He and his team successfully obtained funding support (¥20,000) from the *National-level Undergraduate Innovation and Entrepreneurship Program* with the project of *design and optimization of a non-invasive diagnostic and therapeutic tracked-based capsule colonoscopy system*.

- Supervise undergraduate student **Yi Zhang** to study propeller-driven capsule robots. He successfully obtained funding support (¥40,000, ¥15000) from the ***Climbing Program of Guangdong Province*** and the ***Guangdong Province Undergraduate Innovation and Entrepreneurship Program*** with the project of *paddle-driven capsule endoscope robot for screening and diagnosing digestive tract diseases*. In addition, it guided him to win the Bronze Award at the 7th China International "Internet+" College Students Innovation and Entrepreneurship Competition, the Third Prize at the 13th "Challenge Cup" Guangdong College Students Entrepreneurship Plan Competition, and the Second Prize Scholarship for Outstanding Students at Southern University of Science and Technology.
- Supervise undergraduate student **Zongze Li** to study capsule robots. He successfully obtained funding support (¥20,000, ¥15000) from the ***Climbing Program of SUSTech*** and ***Guangdong Province Undergraduate Innovation and Entrepreneurship Program*** with the project of *design of capsule robot with multiple biopsy and drug delivery functions*. In addition, it guided him to successfully apply for three utility model patents and one invention patent.
- Supervise undergraduate student **Nan Huang** to study microfluidic technology. She successfully obtained funding support (¥20,000) from the ***Climbing Program of SUSTech*** with the project of *Development of physical induction of bone marrow mesenchymal stem cell differentiation based on microfluidic technology*. In addition, it guided her to win the Shuli College "Academic Star" scholarship & the first prize in the university-level student scholarship. She also successfully applied for one invention patent. Now, She is pursuing her PhD at Westlake University.
- Supervise undergraduate student **Jingke Wang** to study micro-nanorobots. She successfully obtained funding support (¥10,000) from the ***SUSTech Undergraduate Innovation and Entrepreneurship Program*** with the project of *preparation and application of multi-ferroic helical micro/nanorobots based on electrospinning*.
- Supervise undergraduate student **Fei Cheng** to study microelectrode chips for micro-nano manipulation. He successfully obtained funding support (¥5,000) from the ***SUSTech Undergraduate Innovation and Entrepreneurship Program*** with the project of *reparation of artificial bone membrane scaffold based on microelectrode chip micro-nano manipulation technology*.
- Supervise undergraduate student **Baoyi Huang** to study capsule endoscope. He successfully obtained funding support (¥20,000) from the ***National-level Undergraduate Innovation and Entrepreneurship Program*** with the project of *design of autonomous navigation capsule endoscope based on state correlation area estimation method*.

- Supervise undergraduate student **Wenxuan Zhang** to study two-stage micro-needles. She successfully obtained funding support (¥ 15,000) from the **Guangdong Province Undergraduate Innovation and Entrepreneurship Program** with the project of *preparation of two-stage micro-needles based on 3D printing technology*. Now, She is pursuing her PhD at The Hong Kong University of Science and Technology (Guangzhou).
- Supervise undergraduate student **Yuan Xie** to study microfluidic chip technology. She successfully obtained funding support (¥ 15,000) from the **Climbing Program of SUSTech** with the project of *regulation technology of internal spatial structure of hydrogel microspheres based on droplet microfluidics*.
- Supervise undergraduate student **Zeliang Liu** to study colonoscopy robots. He successfully obtained funding support (¥ 15,000) from the **Climbing Program of SUSTech** with the project of *design and optimization of non-invasive diagnostic and therapeutic caterpillar-like colonoscopy robot*.
- Supervise undergraduate student **Yizhou Lu** to study micro/nano-robot. He successfully obtained funding support (¥ 15,000) from the **Climbing Program of SUSTech** with the project of *motion control of a magnetically driven micro/nano-robot swarm*. In addition, he received the second-class award for outstanding students at SUSTech.
- Supervise undergraduate student **Yujie Zhang** to study an endoscope robot. She successfully obtained funding support (¥ 18,000) from the **Climbing Program of SUSTech** with the project of *design and optimization of an autonomous navigation capsule endoscope robot*. In addition, her EI conference papers have been accepted. Now, She is in her internship at UC Berkeley.
- Supervise undergraduate student **Ruizhou Zhao** to study an endoscope robot. He successfully obtained funding support (¥ 20,000) from the **Climbing Program of SUSTech** with the project of *micromanipulative robotics for single-cell surgery*.
- Supervise undergraduate student **Zhiyi Zeng** to study swarm microrobots. She successfully obtained funding support (¥ 20,000) from the **Guangdong Province Undergraduate Innovation and Entrepreneurship Program** with the project *Swarm Control of Magnetic Microrobots for Targeted Therapy*.
- Supervise undergraduate students **Jialu Xu, Yuxuan Deng, and Yifan Xuan** to attend the 2021 RoboCom Robot Developer Competition National Competition, which won first prize.

Graduate Student Activities

- Supervise graduate student **Yi Zhang** to study the propeller-driven capsule endoscopy robot. He successfully received the 2023 national scholarship for graduate students, the "Xiake Cup" China Jiangyin Sixth Innovation and Entrepreneurship Competition, Shenzhen second prize, and the IEEE International Conference on Cyborg and Bionic Systems 2022 Best Cyborg System Paper Award.
- Supervise graduate student **Weikang Hu** to study probe technology. He successfully obtained funding support (¥20,000) from the *Climbing Program of SUSTech* with the project of *high-precision intracellular electrochemical sensing and subcellular manipulation integrated probe technology*.
- Supervise graduate student **Yi Xing** to study the medical magnetic microrobot. He successfully received the Graduate Student Innovation Practice Fund.
- Supervise graduate student **Yanchao Jia** to study three-dimensional magnetic field manipulation systems for magnetic microrobots. He successfully received the second prize at the first graduate Engineering Master's Graduation Achievement Exhibition at SUSTech.
- Supervise graduate students **You Li** and **Yueying Tang** to successfully receive the outstanding graduate students at Southern University of Science and Technology.
- Supervise graduate students **Xiaoli He** and **Yanmei Ma** to receive the Best Oral Presentation and Best Poster Presentation Awards, in the "Intelligent Manufacturing and Robotics" at the 2022 Guangdong Graduate Student Academic Forum.

Master Dissertations Directed

Ms. You Li (Currently working at Shenzhen Baoan Foreign Language School)

Mr. Yi Xing (Currently working in Anker Innovation Technology Co., LTD)

Mr. Jianjie Li (Currently working in InsightLifetech Co., LTD)

Mr. Bin Zhang (Currently working in Huawei Technologies Co., LTD)

Ms. Yueying Tang (Currently working in Shenzhen Hongling Middle School)

Mr. Weikang Hu (now a Ph. D. student at the City University of Hong Kong)

Mr. Yanchao Jia (Currently working in HikVision)

Master Students Advised (Current)

Mr. MUYANG RUAN

Mr. XIYU ZHU

Mr. Zongze Li

Mr. Yi Zhang

Mr. Ding Huang

Doctoral Students Advised (Current)

Mr. Huaide Jiang

Ms. Xiaoli He

Ms. Yanmei Ma

Mr. Zhen Zhang

Mr. Ming Yang

Mr. Weikang Hu

Post-doctoral Fellows Supervised

Dr. Tangyong Wei

Dr. Bi Fu

Dr. Zeyang Liu

SERVICE AND PUBLIC OUTREACH

Service to the Discipline/Profession/Interdisciplinary Areas

Editorships/Journal Reviewer Experience

- **Editor**, Cyborg and Bionic Systems, 2023-2025
- **Youth Editor**, Cyborg and Bionic Systems, 2021-2023
- **Guest Editor**, Gels (IF: 4.6), Special Issue " Smart Polymer Gels for Flexible Electronics and Intelligent Micromachines"
- **Guest Editor**, Micromachines (IF: 3.4), Special Issue " Advanced Sensing and Control Technologies for Microrobots"
- **Associate Editor** of ICRA conference
- **Consultant** of Medical Technology of Zhejiang Shang Yi Jian Medical Inc.
- **Journal and Conference Reviewer**: Science Robotics, ACS Nano, Nano Letters, Lab Chip, Advanced Materials, Small, Advanced Functional Materials, Advanced Healthcare Materials, Advanced Materials

Technologies, Biofabrication, Applied Catalysis B: Environmental, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on biomedical engineering, Microfluidics and Nanofluidics, IEEE Robotics and Automation Letters, Frontiers in Robotics and AI, Cyborg and Bionic Systems, ICRA, IROS, IEEE CBS, IEEE Nano, ROBIO, etc.

Committee Memberships

- **Senior Member** of IEEE
- **Member** of ASME
- **Senior Member**, Chinese Society of Micro-Nano Technology
- **Member**, Chinese Association of Automation
- **Member**, Micro-Nano Robotics Council, Chinese Society of Micro-Nano Technology

Review Panels for External Funding Agencies, Foundations, etc.

- **Ministry of Science and Technology of China**
- **National Natural Science Foundation of China**
- **Department of Science and Technology of Guangdong Province**
- **Shenzhen Commission on Innovation and Technology**
- **Division of Civil-Military Integration in Shenzhen**

Organization of Conferences, Workshops

- **General Chair** of IEEE International Conference on Mechatronics and Automation (ICMA), 2025
- **Program Chair** of IEEE International Conference on Mechatronics and Automation (ICMA), 2024
- **Program Chair** of IEEE International Conference on Mechatronics and Automation (ICMA), 2023
- **Program Chair** of ACBD-ISBM2023
- **Program Chair** of Annual Conference for Society of Chinese Mechanical Engineering Biomanufacturing and International Symposium on Bio-Manufacturing, 2023
- **Program Chair** of IEEE International Conference on Cyborg and Bionic Systems (CBS), 2022

- **Program Chair** of IEEE International Conference on Mechatronics and Automation (ICMA), 2019
- **Seminar Chair** of the 2019 Intelligent Micro-Nano Robot
- **Organizer** for Mini-Seminar with Companies such as MicroPort Medical Inc., Anhan Medical Inc., REX Robotics, and ShiPei Technology, BGI Shenzhen.
- **Organizer** for Mini-Seminar among different departments of SUSTech, with Professors from the Department of Biomedical Engineering, Department of Electronic and Electrical Engineering, and Medical School.

Service to the University/Faculty/Department

- Served as the **secretary** of the second party branch of the Chinese Communist Party (CCP) party group of the Department of Mechanical and Energy Engineering from 2019 to 2021.
- Served as the **secretary** of the first party branch of the CCP party group of the Department of Mechanical and Energy Engineering and served as a **Committee Member** of the CCP party branch of Mechanical and Energy Engineering from 2021 till now.
- Served as a **Committee Member** of Biosafety Committee of SUSTech.
- Served as a recruiter to attract and recruit middle school students to join in SUSTech in Guizhou Province, Hebei Province, and Shanghai since 2018 to now.
- **Member** of the General Affairs Committee of the Department of Mechanical and Energy Engineering, 2020
- **Member** of the Public Affairs Committee of the Department of Mechanical and Energy Engineering from 2020 to 2025.
- **Member** of the Academic Degree Committee of the Department of Mechanical and Energy Engineering from 2020 to 2025.
- **Core Member** of Robot Institute of SUSTech.