

# Guojing Huang

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## EDUCATION

**Johns Hopkins University**, Robotics MSE

Aug 2025 – May 2027

- Coursework: Artificial Intelligence (A-), Computer Integrated Surgery I (A-), Robot Devices, Kinematics, Dynamics, and Control (B+)

**The University of Texas at Austin**, Visiting student

Jan 2025 – Feb 2025

- Coursework: Engineering Design (A), Engineering Physics (A), Speaking E (A), Writing E (A)

**Southern University of Science and Technology**, BE in Robotics Engineering

Sep 2021 – Jul 2025

- GPA: 3.60 / 4.00
- Coursework: Robotic Actuation System (96), Fundamentals of Sensing Technology (95), Mechanisms and Applications (94), Robot Operating System (94), Robot Modeling and Control (93), Mechatronic Systems (92), Collaborative Robot Learning (91), CAD and Engineering Drawing (91)

## PUBLICATIONS

1. **G. Huang**, G. Huang, J. Lv, R. Xu, F. Wan, and C. Song, "Parametrically Reconfigurable Pseudo-Open-Chain for Overconstrained Robotic Limbs," submitted to *IEEE Robotics and Automation Letters*, 2026.
2. H. Sun, B. Huang, Z. Zhang, J. Lv, G. Huang, J. Yin, S. Feng, R. Xu, **G. Huang**, N. Qiu, H. Chen, W. Zhang, F. Wan, J. Pan, and C. Song, "Overconstrained Locomotion," submitted to *International Journal of Robotics Research (IJRR)*, 2025.
3. J. Sun, **G. Huang**, C. Lin, W. Pan, K. H. Cheng, G. Gou, S. Huang, Y. Leng, C. Fu, and Z. Chen, "Flexible multi-channel electrical stimulation system for assisting grasping in patients with hemiplegia," in *2024 International Conference on Advanced Robotics and Mechatronics (ICARM)*, 2024, pp. 205–209.
4. H. Sun, S. Feng, B. Huang, Z. Zhang, R. Xu, **G. Huang**, G. Huang, J. Yin, N. Qiu, H. Chen, W. Zhang, J. Pan, F. Wan, and C. Song, "Overconstrained Locomotion," in *International Symposium of Robotics Research (ISRR2024)*, Long Beach, California, USA, 2024.
5. Y. Chen, C. Zhang, P. Gu, J. Qiu, J. Yin, N. Qiu, **G. Huang**, B. Huang, Z. Zhang, H. Deng, W. Zhang, F. Wan, and C. Song, "Evolutionary morphology towards overconstrained locomotion via large-scale, multi-terrain deep reinforcement learning," in *2024 6th International Conference on Reconfigurable Mechanisms and Robots (ReMAR)*, 2024, pp. 401–408.
6. G. Gou, K. H. Cheng, J. Sun, C. Lin, W. Pan, **G. Huang**, Y. Leng, Y. Guo, and C. Fu, "Imu-based prediction of multiple grasping gesture intentions for enhanced functional electrical stimulation control\*," in *2024 International Conference on Advanced Robotics and Mechatronics (ICARM)*, 2024, pp. 183–187
7. Chenglong Fu, Chengjie Zhang, Yuquan Leng, **Guojing Huang**, Yaoyu Cheng, CN116243795B, China, An object grasping method and mixed reality equipment based on mixed reality.

## RESEARCH EXPERIENCE

**PartInstruct: Part-level Instruction Following for Fine-grained Robot Manipulation**

Sep 2025 - present

Advisor: Prof. Tianmin Shu, Johns Hopkins University

Baltimore, United States

- Migrated the project from Pybullet to Isaac Sim. Integrated 600 robot/object assets (including articulated objects) for training.
- Assisted in developing different manipulation skills based on the existing model (grasping and opening).

**Parametrically Reconfigurable Pseudo-Open-Chain for Overconstrained Robotic Limbs**

Sep 2024 - Jul 2025

Advisor: Prof. Chaoyang Song, Southern University of Science and Technology

Shenzhen, China

- Proposed a parametrically reconfigurable pseudo-open-chain quadruped limb derived from the overconstrained Yu & Baker six-bar linkage, enabling rapid reconfiguration into planar and spherical variants.
- Implemented a hierarchical reinforcement learning framework (RSL\_RL) in NVIDIA Isaac Sim with proprioceptive-terrain fusion state representation, achieving 92% terrain adaptation success rate in unstructured environments.
- Trained DRL policies for omnidirectional locomotion under arbitrary velocity commands, achieving better energy efficiency (mean CoT 0.3864 vs 0.6700 planar equivalent) and improved lateral velocity tracking via inherent spatial coupling.
- Forthcoming papers for IEEE RA-L and IJRR; Open-source with URDF specifications and IsaacLab integration (ongoing).

**Investigating Overconstrained Locomotion using Reinforcement Learning**  
Advisor: Prof. Chaoyang Song, Southern University of Science and Technology

Oct 2023 - Jul 2024  
Shenzhen, China

- Minimized physical collisions of the model to reduce computational overhead for 38%.
- Wrote 1088 lines code in total for configuring the robot’s physical properties, initial position, motor parameters, environment integration, articulation motion rate adjustment, random state addition, and reward function design.
- Published an International Symposium on Robotics Research (ISRR) paper and an IEEE/IFTToMM International Conference on Reconfigurable Mechanisms and Robots (ReMAR) paper.
- Won 3 prizes of 23<sup>rd</sup> National CURC RoboCon 2024 Bionic Legged Robot Challenge, and the “Challenge Cup” Guangdong College Student Entrepreneurship Plan Competition Gold Award (0.4%).

**Flexible Multi-Channel Electrical Stimulation System for Assisting Grasping in Patients with Hemiplegia**  
Advisor: Prof. Chenglong Fu, Southern University of Science and Technology

Nov 2023 - Mar 2024  
Shenzhen, China

- Designed a pressure-controlled constant-current FES stimulator and a flexible wearable 16-channel hand FPC electrode patch aligned with intrinsic/extrinsic hand muscle distributions for post-stroke grasp assistance.
- Implemented MCU-to-DAC control to generate adjustable biphasic symmetric pulse trains (amplitude/frequency) and route stimulation to selected channels, enabling closed-loop style parameter tuning for different grasp postures.
- Developed stimulation-mapping workflow to align electrode placement with target muscle groups and improve cross-session activation consistency, and demonstrated fine-grained joint angle modulation by tuning stimulation current amplitude and frequency.
- Published two papers in International Conference on Advanced Robotics and Mechatronics (ICARM).

**An Effective Head-Based HRI for 6D Robotic Grasping Using Mixed Reality**  
Advisor: Prof. Chenglong Fu, Southern University of Science and Technology

Mar 2023 - Jul 2023  
Shenzhen, China

- Developed a point-cloud diffusion method to recognize and reconfigure objects using Unity, utilized HoloLens2 to enable the robotic arm to complete grasping tasks.
- Published a patent and an IEEE RA-L paper, won Second Prize in the “Xiake Cup” Innovation and Entrepreneurship Competition.
- Interviewd by Shenzhen TV, reported and transmitted by SUSTech and several self-media channels.

SELECTED AWARDS AND HONORS

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|---|------|
| • <b>Excellent Undergraduate Graduate</b> , Southern University of Science and Technology                                   | 2025 |
| • <b>Excellent Undergraduate Graduation Project (thesis)</b> , SUSTech  | 2025 |
| • <b>Outstanding Student 2024</b> , Southern University of Science and Technology   | 2024 |
| • <b>Dean’s award</b> , Shude College 2024 scholarship (0.6%)   | 2024 |
| • <b>Nomination Prize</b> , School Motto “Innovation” Series Scholarship, SUSTech (0.2%)                                    | 2024 |
| • <b>First Prize</b> , 23 <sup>rd</sup> National CURC RoboCon 2024 “Granary Returns”- Operation Skills Competition (8/70)   | 2024 |
| • <b>Second Prize</b> , 23 <sup>rd</sup> National CURC RoboCon 2024 “Granary Returns” - Main Competition (23/84)            | 2024 |
| • <b>Third Prize</b> , 23 <sup>rd</sup> National CURC RoboCon 2024 Bionic Legged Robot Competition - Indoor Obstacle Course | 2024 |
| • <b>Third Prize</b> , 23 <sup>rd</sup> National CURC RoboCon 2024 Bionic Legged Robot Competition - Indoor Race Course     | 2024 |
| • <b>Innovation Award</b> , 23 <sup>rd</sup> National CURC RoboCon 2024 Bionic Legged Robot Challenge (1/86)                | 2024 |
| • <b>Gold Award</b> , 14 <sup>th</sup> Challenge Cup Guangdong College Student Entrepreneurship Plan Competition (0.4%)     | 2024 |
| • <b>Outstanding Student 2023</b> , Southern University of Science and Technology   | 2024 |
| • <b>Third Prize</b> , 2023 China College Student Mechanical Engineering Innovation and Design Competition                  | 2023 |

Teaching

- Fall 2024, Teaching Assistant, Mechanical Design, ME311, SUSTech

SKILLS

- **Programming:** Python, C/C++, MATLAB, Java, C#, Linux, Git, LaTeX.
- **Robotics:** Isaac Sim/IsaacLab, Mujoco, Gazebo, ROS2; Robot kinematics & dynamics, Locomanipulation, VLA, sim2sim/sim2real Deployment.
- **Machine Learning:** RL (PPO/SAC, actor–critic, reward shaping, domain randomization); PyTorch, Scikit-learn, Pandas, NumPy.
- **Mechanical Design & Manufacture:** overconstrained mechanisms, CAD (SolidWorks, Fusion360), 3D printing, CNC.
- **Languages:** Chinese (Mandarin and Cantonese) native, English proficient (IELTS 7.0)