Curriculum Vitae — **Hao Cheng**

Ph.D student at Peking University, China

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Homepage: https://hc-robotics.github.io/

Education

Peking University, Beijing, China, Mechanics, Ph.D. candidate, 2021 - present

Tsinghua University, Beijing/Shenzhen, China, Control Engineering, M.S., 2018 - 2021

North China Electric Power University, Beijing, China, Wind Power, B.E., 2013 - 2017 (**Honors**)

Wrocław University of Science and Technology, Wrocław, Poland, Visiting Student, 02/2017 - 06/2017

Research Experience

Design and automation of lighter-than-air aerial robots, Peking University, 2021 - present

Perception and Control of Continuum Robots and Soft Robots, Tsinghua University, 2018 - 2021

Publications

Journal Articles

[1] Y. Zhu, **H. Cheng**, and F. Zhang, "Data-Driven Dynamics Modeling of Miniature Robotic Blimps Using Neural ODEs With Parameter Auto-Tuning," *IEEE Robotics and Automation Letters*, 2024.

[2] **H. Cheng**, Z. Sha, Y. Zhu, and F. Zhang, "RGBlimp: Robotic Gliding Blimp - Design, Modeling, Development, and Aerodynamics Analysis," *IEEE Robotics and Automation Letters*, vol. 8, no. 11, pp. 7273-7280, 2023.

Conference Papers

[1] **H. Cheng**, H. Xu, H. Shang, X. Wang, H.Liu, B. Liang, "Orientation to Pose: Continuum Robots Shape Reconstruction Based on the Multi-Attitude Solving Approach," *IEEE International Conference on Robotics and Automation (ICRA)*, 2022. (**Oral Presentation**)

[2] **H. Cheng**, H. Liu, X. Wang, B. Liang, "Configuration Estimation of Continuum Robots Using Piecewise Constant Curvature Generalized Epi-Polar Constraint Model," *IEEE 17th International Conference on Automation Science and Engineering (CASE)*, 2021.

[3] **H. Cheng**, H. Liu, X. Wang, B. Liang, " Approximate Piecewise Constant Curvature Equivalent Model and Their Application to Continuum Robot Configuration Estimation," *IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, 2020.

Under Review

[1] **H. Cheng** and F. Zhang, "RGBlimp-Q: Robotic Gliding Blimp With Moving Mass Control Based on a Bird-Inspired Continuum Arm," *Preprint*, 2024.

Patents

[1] H. Liu, **H. Cheng**, X. Wang, B. Lan, B. Liang, "Continuum Robot Shape Sensing Method Based on the Multi-attitude Solving Approach," Chinese Patent CN113211440B, 2020.

[2] B. Liang, H. Liu, **H. Cheng**, X. Wang, B. Lan, “Kinematic Equivalence Method of Continuum Robot and Its Application,” Chinese Patent CN111695213B, 2020.

Awards & Honors

- Peking University Outstanding Research Award, 2022
- Tsinghua Comprehensive Excellence Scholarship, 2020
- **Outstanding Graduate at Beijing**, 2017
- **China National Scholarship**, 2015
- China National Encouragement Scholarship, 2014/2016
- NCEPU First-class Honour Scholarship, 2014/2015/2016

Competitions

- 2nd Place in China Graduate Robotics Innovation Design Competition (Team Leader, Designed a Continuum Spinal Rehabilitation Robot), 2021
- 2nd Place in ZC-Cup Frontier Technology Challenge (Team Work, Contributions to the autonomous navigation of a maze challenge), 2020
- **1st Place** in Capital Mechanical Innovation Design Competition (Team Leader, Designed an Express Packaging Robot), 2016
- **1st Place** in China Siemens-Cup Intelligent Manufacturing Challenge, 2016
- **Champion** in Robots Competition of Universities at Beijing (Team Leader, Robots Combat), 2015
- 2nd Place in Beijing Engineering Ability Competition (Team Leader, Designed a Bluetooth Cargo Robot), 2015
- 2nd Place in China LQ-Cup C/C++ Programming Competition (Individual Events), 2015

Academic Service

Reviewer for IEEE ICRA, IROS, CDC, ACC, AIM

Relevant Skills

Programming	C, C++, Python, Matlab
Software	ROS/ROS2, Solidworks, CFD
Hardware	Arduino, STM32, ESP32, Jetson
Engineering	Additive manufacturing, design and fabrication of soft/rigid robots
Language	English, Mandarin

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