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Dr Hao DENG

Contact Information

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Education Background

PhD in Pattern Recognition and Intelligent Systems, University of Chinese Academy of Sciences

Sep. 2017-Jun. 2023
Dissertation: Planning for Robotic Manipulation of Deformation Objects

MS in Mechatronic Engineering, Harbin Institute of Technology

Sep. 2013-Dec. 2015
Dissertation: Research on Path Planning and Bending Control of an Orthodontic Archwire Bending System

BS in Mechanical Engineering and Automation, Wuhan University of Technology

Sep. 2008-Dec. 2012

Academic Appointments

Assistant Professor, SIAT, CAS Since Jul. 2025

Postdoctoral Researcher, SIAT, CAS Jul. 2023-Jul.2025

Supervisor: Prof. Guanglin Li
Project: Grasping Manipulation Planning and Control for Multi-fingered Dexterous Hands

Research Assistant, SIAT, CAS Jan. 2016-Aug.2017

Research Interests

Dexterous hands and Medical Robots:

- modeling, planning and control of medical robot system
- design and development of intelligent mechatronic systems

Human-Machine Collaborative Interface:

- EMG signals in control
- tactile sensing and feedback replay
- hand proprioception reconstruction

Physical Modeling and Simulation:

- Embodied AI learned from physical simulation

Selected Peer-reviewed Publications

[1] **Deng H**, Ahmad F, Xiong J, Xia Z*; A Robot-Object Unified Modeling Method for Deformable Object Manipulation in Constrained Environments, ***IEEE/ASME Transactions on Mechatronics***, 2024, 29(6): 4262-4273.

[2] **Deng H**, Xiong J, Xia Z. An Implicit Solution to the Dynamic Model for Deformable Object Manipulation[J]. ***ROBOT***, 2024, 46(1): 45-53. DOI: 10.13973/j.cnki.robot.230029.

[3] Wang T, Zhang L, **Deng H**, Wang X, Hu Q, Ma X, Zhang X, Li G and Fang P. Preparation, Characterization, and Application Assessment for a Compound-structure Piezoelectret Combining Polypropylene and Fluorinated Polymers, ***Sensors and Actuators A: Physical***, 116774, 393(16), 2025.

[4] Xia, Z, Ahmad F, **Deng H**, Jiang, L, Qin, W, Zhao, Q, Xiong, J*; Robotics Application in Dentistry: A Review, ***IEEE Transactions on Medical Robotics and Bionics***, 2024, 6(3): 851-867.

[5] He S, Shen J, Zhang B, Ahmad F, **Deng H**, Li X, Xiong J*, Xia Z. A Material Point-based Simulation Method for Soft Robots with Free Boundary Interactions, ***Robotica***, 2024, 1-14.

[6] **Deng H**, Xia Z*, Weng S, Gan Y, Xiong J*, Ou Y, Zhang J, Motion Planning and Control of a Robotic System for Orthodontic Archwire Bending, 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (***IROS***), Hamburg, 2015, pp. 3729-3734.

[7] Xia Z*, Deng H, Weng S, Gan Y, Xiong J*, Wang H, Development of a Robotic System for Orthodontic Archwire Bending, 2016 IEEE International Conference on Robotics and Automation (***ICRA***), Stockholm, Sweden, 2016, pp. 730-735.

[8] **Deng H**, Xia Z, Xiong J*, Robotic Manipulation Planning using Dynamic RRT, 2016 IEEE International Conference on Real-time Computing and Robotics (***RCAR***), Angkor Wat, Cambodia, 2016, pp. 500-504

[9] **Deng H**, Xiong J, Xia Z*, Mobile manipulation task simulation using ROS with MoveIt, 2017 IEEE International Conference on Real-time Computing and Robotics (***RCAR***), Okinawa, Japan, 2017, pp. 612-616

[10] Xia Z, **Deng H**, Zhang X, Weng S, Gan Y, Xiong J. A central pattern generator approach to footstep transition for biped navigation. International Journal of Advanced Robotic Systems (***IJARS***). 14(1), 2017.

Patents

[1] Xia Z, **Deng H**, Xiong J. A method, device, electronic equipment and storage medium for operating deformable objects, Chinese Patents, CN202211488337.2, November 25, 2022.

[2] Xia Z, **Deng H**, Xiong J. An orthodontic forceps head, orthodontic instrument robot and forming method, Chinese Patents, CN202211403328.9, November 10, 2022.

[3] Xia Z, **Deng H**, Chen J, Xiong J. Security inspection method, device, equipment and storage medium, Chinese Patents, ZL 201811435872.5, **Granted**: January 1, 2021.

[4] Xia Z, Gan Y, **Deng H**, Xiong J. A soft device and method for eyelid eversion, Chinese Patents, ZL 202110161526.8, **Granted**: May 27, 2022.

[5] Xia Z, Xu G, **Deng H**, Xiong J. A diaphragm movement assist device and diaphragm movement assist system, Chinese Patents, ZL 201910163929.9, **Granted**: August 7, 2020.

[6] Xia Z, **Deng H**, Weng S, Gan Y, Xiong J. Oral orthodontic archwire forming device and its control method, Chinese Patents, ZL 201510493082.2, **Granted**: September 26, 2017.

Software Copyrights

[1] Xia Z, **Deng H**, Xiong J. Deformable Object Robot Operation Simulation and Offline Programming System, 2022SR1494887, **Granted**: November 11, 2022.

[2] Xia Z, **Deng H**, Chen J, Xiong J. Robot Automatic Assembly Programming System, 2019SR0252732, **Granted**: March 15, 2019.

Research Funding

Distinguished Young Scholars of the Youth Innovation Promotion Association, SIAT (RMB 100,000), PI: **Deng H.** 2016-2018

Youth Startup Program, Guangdong-Hong Kong-Macao National Center for Applied Mathematics ((RMB 50,000), PI: **Deng H.** 2025-2027