Zhuo Chen

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Overview

I am passionate about **endowing robots with generalizable, explainable tactile sensing abilities** like humans. In my Ph.D., I mainly focus on addressing challenges in **vision-based tactile sensors** and **contact-rich robot grasping/manipulation tasks with learning-based methods**. Before starting my Ph.D., I had three-year experiences in simulation, fabrication and verification of flexible tactile sensors.

Education

King's College London — Strand, London, United Kingdom
Doctor of Philosophy in Engineering — 2023–2027
Research Interests: Robot Tactile Sensing, Generative Learning — Supervisor: Shan Luo

National University of Singapore — Singapore
Visiting Research Student — 2022–2023
Research Interests: Robot Perception and Learning — Supervisor: Chew Chee-Meng

Xiamen University — Xiamen, China
Master in Mechatronic Engineering — 2019–2022
Research Interests: Robot Tactile Sensing, Soft Robot — Supervisor: Dezhi Wu

Northeastern University — Shenyang, China
Bachelor in Mechatronic Engineering — 2015–2019

Publications

Peer-Reviewed Conference Papers

C1 **Zhuo Chen**, Ni Ou, et al. "Deep Domain Adaptation Regression for Force Calibration of Optical Tactile Sensors."*2024 IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS, oral presentation).

Peer-Reviewed Journal Articles

J1 Ni O, **Zhuo C**, Shan L. "Marker or Markerless? Mode-Switchable Optical Tactile Sensing for Diverse Robot Tasks."*IEEE Robotics and Automation Letters*, 2024 (Under Revision)

J2 **Zhuo C**, Yang Z, Bin Z, et al. "Laser-sculptured hierarchical spinous structures for ultra-high-sensitivity iontronic sensors with a broad operation range."*ACS Applied Materials & Interfaces*, 2022: 19672-19682.

J3 Dezhi W, **Zhuo C**, Zhenyin H, et al. "Research Progresses of Micro-area Induction Heating Technology in Micro/Nano Systems."*China Mechanical Engineering*, 2022, 33(01): 2

J4 Dezhi W, Xiangqi C, **Zhuo C** et al. "A flexible tactile sensor that uses polyimide/graphene oxide nanofiber as dielectric membrane for vertical and lateral force detection."*Nanotechnology*, 2022, 33(40): 405205

J5 Hang Y, qibin Z, Jiawei L, **Zhuo C**, et al. "One-step fabrication of high-performance graphene composites from graphite solution for bio-scaffolds and flexible strain sensors."*Nanotechnology*, 2023, 34(31): 315301

J6 Yigen W, Zhongbao W, Jinbin X, **Zhuo C**, et al. "Direct Writing of Liquid Metal onto an Electrospun Graphene Oxide Composite Polymer Nanofiber Membrane for Robust and Stretchable Electrodes."*Advanced Materials Technologies*, 2023, 8(9): 2201935

J7 Yigen W, Zhongbao W, Guolong Z, Zhenjin X, Zhenyin H, **Zhuo C**, et al. "Printing of tactile sensors upon the surface of pneumatic soft gripper by direct writing and electrospraying to enable intelligent grasping."*Advanced Engineering Materials*, 2022, 24(12), p.2200704.

J8 Yigen W, Guolong Z, Jinbin X, Jiahong Z, Xinqi C, Zhongbao W, **Zhuo C**, et al. "A bioinspired multi-knuckle dexterous pneumatic soft finger."*Sensors and Actuators A: Physical*, 350 (2023): 114105.

Patents

P1 Dezhi W, **Zhuo C**, et al. "A Flexible Capacitive Pressure Sensor and Manufacturing Method."No. CN113959603A

P2 Dezhi W, Cong C, **Zhuo C**, et al. "A High Linearity Flexible Pressure Sensor with Adjustable Sensitivity and Its Fabrication Technique."No. CN114088254B

P3 Dezhi W, Xianshu C, **Zhuo C**, et al. "A High-Performance Capacitive Flexible Pressure Sensor and Manufacturing Method."No. CN114370958B

Proceedings Extended Abstract

A1 Zhuo Chen, Shan Luo, et al. "Deep Domain Adaptation Regression for Force Calibration of Optical Tactile Sensors."*ICRA 2024 Workshop on "Robot Embodiment through Visuo-Tactile Perception"*

Experiences

King's College London London, United Kingdom
Research Assistant (Part-time) 2023.11 - 2024.5

- Leading a GenForce project for general unsupervised force calibration of tactile robotics by using generative models (diffusion, conditioinal-GAN, cycleGAN) and deep domain adaptation regression method.
- Collaborating on two projects. One is about mode-switchable optical tactile sensing using diffusion models and regressive models. The other one is about sim-to-real self-preservation robot learning.

Teaching Assistant *Kinematics & Motion Planning* 2023.9 - 2023.12

Selected Honors & Awards

IMPRS-IS Offer Holder 2023
Full funding for doctoral program in International Max Planck Research School for Intelligent Systems.
National Scholarship for Postgraduate 2022
Award to top 1% graduate students with excellent academic track in China.
China Government Scholarship 2021
One-year full funding for visiting research at National University of Singapore.

Service

Reviewer for IEEE Transactions on Robotics (T-RO), IEEE Robotics and Automation Letters (RA-L), ACS Nano, ACS Applied Materials & Interfaces, Nanotechnanogy, Sensors.

Workshop

- ICRA 2024 Workshop on "Robot Embodiment through Visuo-Tactile Perception"
- 5th UK Manipulation Workshop in Oxford University

Skills & Interests

Programming: Pytorch, Python, C/C++, ROS, Mujoco, Issacgym, OpenCV, Java, Labview
Engineering: Solidworks, 3Ds Max, Ansys, Abaqus, Adobe Illustrator
English: IELTS(7.0)
Interests: Photography, Hiking, Gym, Singing, Cooking