

Soft Robotics Seminar

Design, Modeling, and Fabrication of Origami and Soft Robots



Dr. Hongying Zhang
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Date Feb. 24, 2023 (Fri)

Time 15 : 00 ~ 16 : 00

Venue BKC Campus, Ritsumeikan Univ.
EastWing 4F, Seminar Room 4

Host Department of Robotics, Ritsumeikan Univ.
Zhongkui Wang

zoom <https://ritsumeiaacjp.zoom.us/j/92740567723>
Meeting ID: 927 4056 7723

Organizer: Robotic Research Center, Ritsumeikan Univ.

Abstract

To achieve safer and closer interaction with people, robots are shifting from wholly rigid to compliant, namely origami and soft robots. The origami robots achieving functional movability by folding, can be designed by replacing revolute joints of rigid robots with compliant folding hinges. If we further replace the whole body of rigid robots with soft materials, we can create soft robots. This talk will cover how to automatically design and fabricate soft grippers by structural optimization method and 3D printing technique. The design and modeling of novel origami robots and ultra-lightweight, origami-inspired metamaterial will also be presented. It will also be highlighted on how soft and origami robots can uniquely contribute to the development of high-performance robots by introducing compliance to their structures. Finally, a vision of future research on soft and origami robotics will be elaborated.

Biography

Dr. Hongying Zhang received her B.S. degree from Huazhong University of Science and Technology in 2013, and her Ph.D. degree at the National University of Singapore in 2018. Her Ph.D. study is mainly on designing a series of topology-optimized soft grippers and wearable dielectric sensors. Sponsored by the Facebook Virtual Reality Lab, Dr. Zhang joined Prof. Jamie Paik's group at the École Polytechnique Fédérale de Lausanne (EPFL) as a postdoctorate researcher. At EPFL, Dr. Zhang has led the work on developing a comprehensive model to analyze novel origami robots and designing high-strength origami metamaterials. Dr. Zhang is now leading a research group to develop compact robotic systems with compliant structures and smart control to synergize mechanical intelligence and machine intelligence.