

IEEE UK & Ireland RAS Chapter Prestigious Lecture

The prestigious lecture will introduce the theoretical development and the technological innovation in robotics, and present the reconfigurable mechanisms and robots that are entailed by kinematics. The intrinsic theory in the study of kinematics has laid a foundation for the development of reconfigurable mechanisms and various forms of robots, leading to 20 years of innovation in metamorphic mechanisms, reconfigurable robots and evolutionary robots.

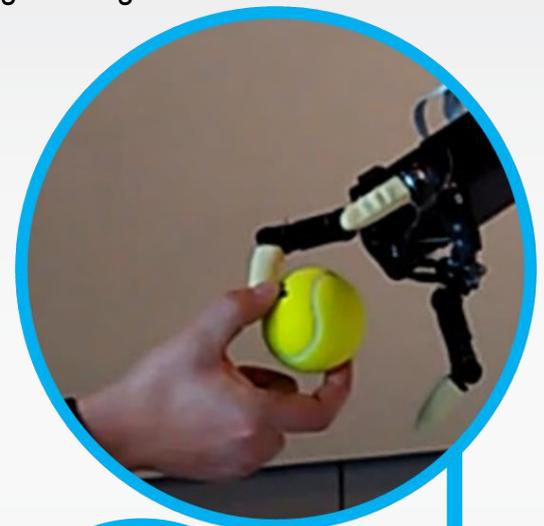
Prof Dai will give a philosophical view over the entwinement between robotics and arts, and present decades of development in origami robots, arts robots, metamorphic robots, manufacturing robots, rehabilitation robots and reconfigurable robots. This entwinement is elevated by using mathematical tools, particularly the advanced kinematics with screw theory and its relations to Lie groups and Lie algebra through finite screws in the form of Lie groups. With the change of the order of a screw system, a reconfigurable mechanism, as the core of a robot, enables it to change its mobility and present different topologies, adapting to changing requirements and operating environments for variable tasks.

Extensive applications of the reconfigurable mechanisms and robots will be demonstrated in respect of assembly, packaging, food industry, domestic robots, rescue robots, walking robots, origami robots, rehabilitation robots and medical robots, leading to robots of future in the decades ahead.

Kinematics in Robotics, Entailing Metamorphic and Reconfigurable Mechanisms

Prof. Jian Dai

2020 ASME Machine Design Award recipient.
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Time: 12:00-13:30 (UK:GMT)
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