

**DEPARTMENT OF MECHANICAL ENGINEERING****SEMINAR****Online**

Title: A High Efficiency Double Acting Soft Actuation

Speaker: Mr. Liu Hao (PhD candidate)
Department of Mechanical Engineering
The University of Hong Kong
Hong Kong

Date: 28 April, 2022 (Thursday)

Time: 2:30 p.m. (Hong Kong Time)

Zoom meeting: 1) Link to join the meeting:

<https://hku.zoom.us/j/91892556035?pwd=bkjpNIY1bkRXQ2ZjZng2dHN2WnNYdz09>

2) Meeting ID: 918 9255 6035

3) Password: 807435

Abstract:

When twisting an elastic tube filled with fluid, the tube will contract and fluid inside the tube will be extruded out, generating both tendon-driven and fluidic actuation, called twisting tube actuation (TTA). Based on the TTA method, a novel soft bending actuator driven by tendon and fluidic power, namely double acting soft actuator (DASA) is proposed. The DASA can be actuated in four different modes by changing the fluid type or choosing to use the tendon or not. Experimental characterization of the DASA's bending angle, bending speed, bending force, and stiffness are conducted for the four modes of actuation in this seminar. Most of all, the mechanical efficiency of the DASA is quite high compared to soft pneumatic bending actuators. The mechanical efficiency of a soft pneumatic bending actuator is only 1.09%, and the mechanical efficiency is increased by 25.2 times to 27.48% when the proposed DASA works in the hydraulic plus tendon (HPT) mode thus making it more practical for more potential applications. A novel three-finger soft gripper based on the DASA has been developed for grasping tests and demonstration.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. Y.H. Chen at 3917 7910.

Research area: Additive Manufacturing & Design