

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

Title: Reinforcement Learning for Artificial Microswimmers

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Date: 6 May, 2022 (Friday)

Time: 10:00 a.m. (Beijing Time)

Zoom meeting: 1) Link to join the meeting:

<https://hku.zoom.us/j/94648126271?pwd=ZldoNUtUUWxZdVN3RExlYnJydmMydz09>

2) Meeting ID: 946 4812 6271

3) Password: 206867

Abstract:

Artificial Microswimmers provide exciting opportunity in biomedical applications such as targeted drug delivery and microsurgery. Successful biomedical applications of artificial microswimmers rely on their ability to traverse complex biological environments, including blood-brain and tumor microenvironments. Understanding hydrodynamic interactions between artificial microswimmers and controlling their motions under such complex environments are necessary steps toward practical applications. In the fluid environment at the microscale, viscous forces dominant and inertia forces become negligible, thus, propelling particle forward becomes a more challenge task compared with the macroscale. Here we numerically investigate the dynamics of reconfigurable 3-sphere microswimmers. We demonstrate that the swimmer-swimmer interaction is a complicated function of their relative distance, phase and orientation, leading to long term trajectory that can be repulsive, attractive, oscillatory and parallel. Then we apply reinforcement learning tools on a system of two microswimmers to design their effective locomotory gaits, and control their interaction modes in expected long-term trajectories of the swimmers.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. A.C.H. Tsang at 3917 1505.

Research area: Biomedical Engineering