Department of Biomedical Engineering

<u>Research Student Seminar Series</u>

(Supervised by Prof. King LAI)

Scalable Fabrication of Nano-yarn-based Strain Sensor for Motion Sensing

Mr. Chan Pak Yu Colin
Ph.D. candidate

Date:	November 29, 2023
Time:	2:30pm-2:45pm
Venue:	B6619 Conference Room, 6/F, Blue Zone, Yeung Kin Man Academic Building

Abstract

Nanomaterials have gained significant attention in fabricating on-skin and wearable electronic devices, offering diverse applications in interactive touch screens, pressure sensors, strain sensors, and medical devices. Researchers have explored stretchable conductive fibers embedded in soft polymers for their lightweight, flexible nature and fabric attachment capabilities. Various natural materials, including flax, cotton, wool, and silk, have created flexible sensors. High conductivity in natural materials can be achieved through carbonization or coating processes using conductive particles like graphene, carbon nanotubes,

and liquid metal. However, these processes have drawbacks such as elevated working temperatures, complex setups, lengthy durations, and labor-intensive procedures. The dipping coating technique, while promising, also faces challenges in achieving precise thickness control, uniform particle coverage, and proper adhesion for long-term durability. This study introduces an automated machine and a layer-by-layer dip coating approach to address these challenges in fabricating polyurethane yarn (PUY)-based strain sensors. The novel technique significantly reduces production time, increases success rates, and demonstrates the potential for efficient and scalable fabrication of PUY-based strain sensors.

Biography

Chan Pak Yu Colin is now pursuing a Ph.D. degree in Prof. LAI Wai Chiu King's group with the Department of Biomedical Engineering, City University of Hong Kong. His research interests include mechanical and robotic design, service robotics, in-pipe underground robotics and soft robotics.

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All are Welcome!