Department of Biomedical Engineering

Research Student Seminar Series

(Supervised by Prof. King LAI)

Assessing Lower Limb Movement Performance in Elderly Individuals Using a Nanocomposite E-Textile Sensor

Mr. Xiaoyang Zou
Ph.D. candidate

Date:	November 29, 2023
Time:	2:00pm-2:15pm
Venue:	B6619 Conference Room, 6/F, Blue Zone, Yeung Kin Man Academic Building

Abstract

The knee joint is one of the most important joints in our lower body, affecting humans' lower limb activities. For instance, the knee joint can even bear three to four times the human body's weight when running and climbing. The knee joint is prone to degenerative lesions for older people as they age, which significantly affects their daily lives. Therefore, long-term and real-time assessment of lower-limb motions in older people is crucial for their lower-limb health detection. In this work, we developed wearable knee sensors based on nanocomposite e-textile strain sensors for detecting knee joints' range of motion (ROM) while

older people perform lower-limb activities. A total of ten features were extracted to characterize their sit-to-stand (STS) performance by detecting their knee joint range of motion through normal speed and fast speed STS. The elderly subjects were grouped by their age, gender, and body mass index (BMI) to assess the relationship of these three parameters with the extracted features. As a result, the stability, ROM, and gender of elderly subjects while performing fast speed STS had a significant relationship with age and BMI ($P<0.05$). The result demonstrates the generalizability of e-textile sensors for assessing lower-limb motions, which shows great potential for long-term and real-time detection of lower-limb health in older people.

Biography

Xiaoyang Zou is now pursuing a Ph.D. degree in Dr. King Lai's group with the Department of Biomedical Engineering, City University of Hong Kong. His research interests include on-skin electrodes and soft actuator.

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All are Welcome!

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