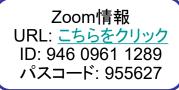# 早稲田大学スポーツ科学学術院スポーツ科学研究センター　主催
早稲田大学スーパーグローバル大学創成支援事業 スポーツ健康科学拠点共催
第244回スポーツサイエンス研究会

日時　2024年1月8日（水）13:00 より

場所　早稲田大学所沢キャンパス 100号館 第一会議室

演題　Exploring Advanced Training Facilities for Athletes: Innovations in Soft Robotics, Motion Analysis and Bilateral Treadmill Design

演者　**Prof. Raymond Kai-Yu Tong（The Chinese University of Hong Kong）**

抄録

　In this seminar, we develop the latest advancements in training facilities for rehabilitation, focusing on soft robotics, motion analysis and balance. Our team is currently developing a novel AR-based Bilateral Treadmill Training System, which we believe will be of great interest to the sports science community. Our system features several innovative components, including a markerless and real-time motion capture system that allows for precise motion analysis without the need for markers. The bilateral belt treadmill supports different speed ratios between belts, enabling varied training scenarios. Additionally, the Femto Mega depth sensor camera requires only one or two cameras for the entire training system, enhancing efficiency. The markerless gait analysis is applicable to any treadmill with embedded force sensors, providing comprehensive gait analysis. Real-time monitoring and visual feedback offer immediate biomechanical feedback to athletes, while comprehensive gait pattern analysis includes both kinematic and kinetic data for detailed assessments. Motor and balance control assessments evaluate athletes' motor skills and balance.

　We see significant potential for applying this system in sports training. The bilateral belt design allows for a range of speeds and sudden movements, making it suitable for various training intensities. Our preliminary data from stroke rehabilitation training demonstrates immediate training effects and improvements in balance with soft robotic training, as evidenced by changes in the center of pressure (COP) after ten sessions. I look forward to presenting our work, discussing potential collaborations and contributing in sports science.

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