WESTERN SYDNEY UNIVERSITY

School of Computer, Data and Mathematical Sciences

HDR Seminar 9
Program
26 May 2021

Time	Details
4:00pm - 4:10pm	**Briefing** **Topic: Policy update and announcements** A/Prof Dongmo Zhang
4:10pm - 4:40pm	**Invited speech** **Topic:** The Active Minds Music Ensemble: An online music education program for older adult novices **Speaker:** Dr Anthony Chmiel, MARCS Institute for Brain, Behaviour and Development
4:40pm - 5:00pm	**Conference presentation** **Topic:** A New Pathway to Approximate Energy Expenditure and Recovery of an Athlete **Speaker:** Fabian Weigend (PhD Candidate - 18885806) **Supervisory panel:** A/Prof Oliver Obst and Prof Simeon Simoff
5:00pm - 5:20pm	**Candidature Research Presentation** **Topic:** Human Posture Recognition and Assessment of the Variability Among Work-Related Activities **Speaker:** Feridun Talat (PhD Candidate - 15943646) **Supervisory panel:** Dr Jim Basilakis, Quang Vinh Nguyen and Paul Marshall
5:20pm	**Closing**

Venue: Parramatta South EA.G.34 & Online Zoom
Zoom ID: 886 7872 4041

Next HDR Seminar: 23 June 2021

The Active Minds Music Ensemble: An online music education program for older adult novices

Speaker: Dr Anthony Chmiel – The MARCS Institute for Brain, Behaviour and Development

Abstract: Music has long been suggested as an effective tool to assist healthy ageing, such as through facilitating social and cognitive skills. However, the majority of prior research on older adult music education is qualitative in nature, and has been limited to a maximum time period of 3 months. This talk will outline the Active Minds Music Ensemble, part of an ARC Discovery Project at MARCS that provides older adult novices aged 65-80 with 12 months of free music lessons. Longitudinal mixed-methods data are collected every 3 months over the education period, as well as for a follow-up period of 6 months. Since March 2020, the entire program has been shifted online. Some of the key questions to be explored are whether or not there are observable differences between the instruments used (keyboard versus iPad app), the specific education focus (learning to reproduce music versus learning to improvise music), and between the face-to-face and online formats.

Biography:
Anthony is a Research Assistant for the ARC Discovery Project "Maintaining active minds and bodies through older adult music education".
Working with Dr Jennifer MacRitchie, Prof. Roger Dean, and Prof. Kate Stevens, Anthony is investigating how music education programs can best be delivered to older adults to achieve maximum gain, both in their rate of improvement in cognitive and motor tasks, and their general sense of wellbeing and achievement.

Quranic Education and Technology: A New Pathway to Approximate Energy Expenditure and Recovery of an Athlete
Speaker: Fabian Weigend
Abstract: This work proposes to use evolutionary computation as a pathway to allow a new perspective on the modelling of energy expenditure and recovery of an individual athlete during exercise.

We revisit a theoretical concept called the "three component hydraulic model" which is designed to simulate metabolic systems during exercise and which is able to address recently highlighted shortcomings of currently applied performance models. This hydraulic model has not been entirely validated on individual athletes because it depends on physiological measures that cannot be acquired in the required precision or quantity.

Our paper introduces a generalized interpretation and formalization of the three component hydraulic model that removes its ties to concrete metabolic measures and allows to use evolutionary computation to fit its parameters to an athlete.

Human Posture Recognition and Assessment of the Variability Among Work-Related Activities

Speaker: Feridun Talat
Abstract: Musculoskeletal disorders (MSDs) are the most common work-related condition in Australia despite the fact there are known methods to eliminate or minimise them. Lifting is a common activity in the workplace and associated injuries are substantial. Thus, to improve workplace safety, it is necessary to assess musculoskeletal and biomechanical risk exposures associated with such activities by measuring the joint kinematics and assessing the range of motions through biomechanical analysis. Limited research has been conducted for assessing 3D joint kinematics for work-related activities using computer vision-based marker-less

methods. The motivation of this thesis is to investigate the reliability and validity of available off-the-shelf tools that capture and measure body movement at low-costs and introduce an innovative and practical human posture recognition and kinematic assessment system. This could be used during training sessions to support and optimise the long-term performance of workers and hopefully reduce the risk of MSDs in the workplace.