4. Workshop 4

August 21st (Sunday) 13:00-17:45 / Room 515

Title	Guiding Physical Therapy Using Computational Modelling Techniques
Organizers	● **Dr. Tomislav Bacek**, Research Fellow, University of Melbourne, Australia, Email: tomislav.bacek@unimelb.edu.au ● **Prof. Denny Oetomo**, University of Melbourne, Australia, Email: doetomo@unimelb.edu.au ● **Prof. Dana Kulic**, Monash University, Australia, Email: dana.kulic@monash.edu
Abstract	The advancements in robotic and sensing technologies, data science, and computer-simulated environments, and the ever-growing knowledge in physical therapy (PT) of movement impairments have opened an enormous potential for personalised, effective, and collaborative gait rehabilitation. However, the available technologies are yet to be exploited to their full potential and close the gap between the research environment and clinical practice. This workshop will bring together renowned speakers from the relevant fields of physiotherapy, machine learning, human movement, computational modelling, and biomechanics to present state-of-art in technology-assisted physical therapy and provide insights into current challenges and future trends.

List of Talks			
First Slot (135 min)			
1	13:00-13:10 (10 min)	**Workshop organizers**	Opening Remarks
2	13:10-13:35 (25 min)	**Prof. Marcus Pandy**, University of Melbourne, Melbourne, Australia	Motion and Joint Function in Human Gait
3	13:35-14:00 (25 min)	**Prof. Gavin Williams**, FACP, University of Melbourne and Epworth Hospital, Melbourne, Australia	Robot-Assisted Gait Therapy – What is Missing from a Clinical Perspective?
4	14:00-14:25 (25 min)	**Dr. Tomislav Bacek**, Research Fellow, University of Melbourne, Melbourne, Australia	Understanding Human Gait Signature – Preliminary Results of a Large Biomechanical Study
5	14:25-14:50 (25 min)	**Dr. Antoine Falisse**, Research Fellow, Stanford University, CA, USA	Predictive Simulations and Their Role in Understanding Neuromechanics of Gait
6	14:50-15:15 (25 min)	**Scott Starkey**, PhD student, Centre for Health, Exercise, and Sports Medicine, University of Melbourne, Australia	Electromyogram- and Magnetic Resonance Imaging-informed Neuromusculoskeletal Modelling in the Context of Clinical Rehabilitation
Second Slot (135 min)			
1	15:30-15:55 (25 min)	**Prof. Massimo Sartori**, University of Twente, Enschede, The Netherlands	Neuromusculoskeletal Modelling-Based Control of Exoskeletons
2	15:55-16:20 (25 min)	**Prof. Heike Vallery**, TU Delft, Delft, The Netherlands	Body-Weight Support and its Influence on Neuromuscular Modelling and Gait Neurorehabilitation
3	16:20-16:45 (25 min)	**Dr. Fabian Horst**, Research Fellow, Johannes Gutenberg-University Mainz, Mainz, Germany	Using Machine Learning Techniques to Explain and Characterise Human Gait Patterns
4	16:45-17:10 (25 min)	**Prof. Laura Marchal-Crespo**, TU Delft, Delft, The Netherlands	Error Augmentation, Motivation, and Haptic Intervention During Motor Learning
5	17:10-17:45 (35 min)	**PANEL DISCUSSION**	