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ISBS 2015

FROM MEASUREMENT TO MODELLING IN SPORT COLLISIONS



DEPARTMENT FOR HEALTH
Sport, Health and Exercise Science



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SCHOOL OF SPORT, EXERCISE
AND HEALTH SCIENCES

ISBS 2015 – APPLIED SESSION ORGANISATION

TITLE

FROM MEASUREMENT TO MODELLING IN SPORT COLLISIONS.

PEOPLE INVOLVED

Coordinator

Dr Ezio Preatoni (Department for Health, University of Bath)

Lecturers

Dr Grant Trewartha (Department for Health, University of Bath)

Dr Dario Cazzola (Department for Health, University of Bath)

Dr Matthew Pain (School of Sport, Exercise and Health Sciences, Loughborough University)

SHORT BIOS

Dr Ezio Preatoni



 @iszio

Ezio joined the University of Bath in August 2010, where he is currently Lecturer (Assistant Professor) in Biomechanics and Motor Control.

Ezio's research is on human movement dynamics and aims at understanding the determinants of change in movement execution and coordination, and the role of movement variability in the acquisition, retention and recovery of motor skills. Ezio's research activity is mainly in the sports biomechanics area, and has recently focussed on the use and integration of advanced technologies and methodologies for the assessment of performance, injury mechanisms and injury prevention.

Ezio was awarded the "Hans Gros New Investigator Award" by the International Society of Biomechanics in Sports in 2008, and has been a member of the board of directors of ISBS since 2014. Ezio is an active member of the Rugby Science group of the University of Bath (RS@Bath) and is Section Editor of the World Rugby Science Network.

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Dr Grant Trewartha



 @utility_back

Grant joined the University of Bath in 2001, where he is currently a Senior Lecturer in Biomechanics, Director of Studies for the BSc/MSci Sport & Exercise Science programmes and provides project supervision on the MSc Sports Physiotherapy and MSc Sport & Exercise Medicine programmes.

Grant's research is mainly concerned with primary injury prevention, involving studies of injury epidemiology, injury mechanisms, and more recently implementation of exercise-based injury prevention interventions. Within sport, this research is primarily related to injury prevention in Rugby Union – the RS@Bath research programme has ongoing projects with the Rugby Football Union (England) and previously for the International Rugby Board (IRB). Within health research, Grant's interests are mainly the control of balance in relation to trips and stumbles during locomotion.

Grant is one of the founding Network Editors of the World Rugby Science Network, an international forum for disseminating and fostering research of the Rugby Football codes. www.irbsciencenetwork.com has ~900 currently signed-up members and @RugbySciNetwork has over 3000 followers.

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Dr Dario Cazzola



 @darione581

Dario joined the University of Bath in November 2012 and he is currently Lecturer (Assistant Professor) in Biomechanics. Dario obtained the laurea degree (BSc plus MSc) in Biomedical Engineering (2007) from Politecnico di Milano and a PhD degree in Human Physiology (2010) from Università degli Studi di Milano.

Dario's research is on human movement analysis and biomechanics of injury in sport. His research approach is based on musculoskeletal modelling and computer simulation with a specific application to injury prevention and ergonomics. Dario's interests also include bioenergetic of human locomotion and sports biomechanics (e.g. race walking and rugby).

Dario is the project leader of the OpenSim SimTK-Project on the 'Cervical Spine Injury Mechanisms Analysis in Sport' (<https://simtk.org/home/csibath>), and attended the 'OpenSim Advanced User Workshop' at Stanford University (US) in 2014 and 2015. Dario is an active member of the Rugby Science group of the University of Bath (RS@Bath), and member of the editorial board of the World Rugby Science Network.

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Dr Matthew Pain



Matt joined Loughborough University in 2000 and is currently a Reader in Biomechanics and Director of Education for the National Centre for Sport and Exercise Medicine East Midlands.

Matt's research interests include: impacts and soft tissue motion; maximal voluntary muscular actions; neuro-muscular performance and coordination; and the development of novel methodologies and techniques to investigate these issues. These areas are fundamental to understanding performance and injury mechanisms in combat, contact and power-based sports, as well as being components in the healthy functioning of the human body.

Matt is an associate editor for the Journal of Applied Biomechanics, and has reviewed for dozens of journals, and Research Council grants. His research has led him to be involved in a substantial amount of international TV and media work; pedagogic work outside of the University; and as a consultant to the police, forensic science services and law firms.

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DESCRIPTION OF THE APPLIED SESSION

The session will show how complex research topics in the area of injury prevention, such as sport collisions, could be addressed by implementing an integrated biomechanical approach. The multiple scale of the analysis and their interconnection will be described with respect to specific applied scenarios (e.g. rugby scrummaging and landing/kicking), starting from the use of multiple measurement technologies in an in-vivo experimental setting, and getting to how this information could be used to drive computer simulation for the study of potentially injurious events and tissue mechanics.