Editorial

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Biographical notes: Gunther Paul holds a Master's degree in Mechatronics and a PhD in Ergonomics from TU Darmstadt in Germany. After working in research and academic teaching at TU Darmstadt for five years, he joined FORD Motor Company in 1999. He developed and managed projects in product development, information technology and manufacturing engineering at Ford, Faurecia and Daimler until 2009. He was then invited to Australia, to establish a laboratory and research group in ergonomics at the University of South Australia. He is now a Senior Lecturer for Occupational Safety, Health and Ergonomics at Queensland University of Technology and Postgraduate Research Coordinator of the School of Public Health and Social Work. He is co-chair of the IEA Technical Committee for Human Simulation and Virtual Environments.

James Yang is currently Associate Professor and Director of the Human-Centric Design Research Lab, Department of Mechanical Engineering, Texas Tech University, Lubbock, Texas, USA. He received his BS and MS in Automotive Engineering from Jilin University, and PhD in Mechanical Engineering from the University of Iowa, Iowa City, Iowa, USA. He was a faculty member at the Department of Automotive Engineering, Tsinghua University, Beijing, and Research Engineer and Adjunct Professor at the Center for Computer Aided Design with the Department of Mechanical and Industrial Engineering at the University of Iowa. His research interests include physics-based human modelling and simulation, bio-inspired systems, ergonomics, biomechanics, healthcare engineering, and robotic and mechanical systems.

The 2nd International Digital Human Modeling (DHM) Symposium was held at the renowned University of Michigan Transportation Research Institute (UMTRI) in Ann Arbor, Michigan in June 11–13, 2013. The symposium was co-organised by the UMTRI and Penn State University, and endorsed by the IEA Technical Committee on Human Simulation and Virtual Environments. The conference built on the very successful inaugural event DHM2011 held in Lyon two years before; and a decade of digital human modelling conferences held under the auspices of SAE International. Practitioners and scientists from 13 countries gathered to present their state-of-the-art developments and applied research, besides discussing the most recent advances in human modelling and directions for future work in DHM.

To honour the organisers for their relentless determination to make this event such a great success, the *International Journal of Human Factors Modelling and Simulation* presents this special issue. While commemorating a great achievement, this compilation is also a personal thank you to Dr. Matt Reed (University of Michigan) and Dr. Matt Parkinson (Pennsylvania State University) for their outstanding leadership.

The special issue showcases DHM research from three different continents in five selected and significantly expanded papers which were initially presented at DHM2013.

Alexander MacIntosh and co-authors from McMaster University in Canada assess finger joint loading during dynamic finger pressing tasks, using a musculoskeletal human model and determine that better understanding of finger joint loading is essential to the prevention of work-related musculoskeletal disorders of the hand and fingers.

Joseph Pellettiere and David Moorcroft from the US Federal Aviation Administration in Washington discuss validation of simulations and the certification of analytical assessments in the aircraft industry. They present a method that deals with robustness and uncertainty issues in modelling.

Xianlian Zhou et al. from the CFD Research Corporation in Huntsville, Alabama develop a simulation model to predict neck loading and investigate musculoskeletal fatigue of combat pilots during high-G aerial combat manoeuvring (ACM). Based on a whole body articulated multi-body model with detailed neck musculature, the study focuses on the decrease of muscle force generation capacity during intensive muscle contraction, introducing a new dynamic muscle fatigue model. The authors then compare and assess muscle fatigue in two different flight postures, look-ahead and check-6.

Gunther Paul from Queensland University of Technology, Australia together with Jason Miller from Swinburne University of Technology and Jon Pendlebury from Ford in Australia explore the dynamic interaction between the human occupant and a seat. For this purpose they develop a finite element model of human thigh and pelvis, as well as a seat cushion and cushion frame of a spring suspended car seat. The simulation provides insight into the human-seat interface pressure, which influences human seated posture.

Peter Mårdberg and co-authors from the Fraunhofer-Chalmers Research Centre for Industrial Mathematics at Chalmers University of Technology, together with Dan Högberg from the University of Skövde and Lars Hanson from Scania in Sweden present an approach to automatically generate predetermined motion time system (PMTS)-based assembly instruction lists from simulations in DHM systems. The task simulation automatically instructs a manikin to perform assembly operations. The approach is implemented in the DHM software IMMA and tested on industrial cases of manual assembly in the automotive industry.

The 3rd International DHM Symposium in conjunction with the 3rd International Summit on Human Simulation was held at Odaiba, Tokyo, Japan in May 20–22, 2014 hosted by the Digital Human Research Center at the National Institute of Advanced Industrial Science and Technology (AIST). The successful conference attracted many excellent papers and we look forward to forthcoming submissions from this conference to the *International Journal of Human Factors Modelling and Simulation* to share the latest research in digital human modelling.

We thank all authors and reviewers for their dedicated work to support this special issue.