Preface

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With ever increasing use of information technology, digital human modelling and models is becoming a vital part in product design, development and evaluation. Digital human models enable cost effective design exploration, reduce cost and time for prototype development, enable effective product customisation, and enable low cost virtual evaluations. In addition, digital human models enable better product design by providing accurate human data in a usable format. With the ever increasing move toward e-shopping and powerful computers, the accuracy of digital human models improves. Accurate digital human modelling will be able to include internal structures as well as surface anatomy and simple biomechanics.

This special issue captures the recent advances in digital human modelling for product development. We received many papers for the special issue and we thank all authors who submitted their work. However, after rigorous peer review only seven papers were accepted for publication. The papers range from modelling the head, fingers, waist, foot, and body contour. The papers involve techniques related to anthropometry, surface anthropometry, and modelling for product design clearly showing the wide range of interest in digital human models in product design and development. Hence, more research is essential to cover the various disciplines including theoretical, methodological, computational, physiological and relevant applications.

Three papers are related to measurement and data modelling while four papers are related to product design. The first paper by Luximon and Ball provide comparison of different methods for head measurements: anthropometric studies and scanning technologies. It is very important to know measurement errors in traditional and new technologies. This has been addressed by Luximon and Ball. The paper by Sixiang et al. uses data from a 3D whole body scanner to analyse the waist and hip sections, which have an influence on body mass index and clothing design. The study enables classification of different body types based on the analysis of the data. The paper by Condell et al. proposes a new method, using wearable sensor enabled gloves, for finger

movement measurement. Although they focused on arthritic patients, the method can be used on anyone.

The other four papers relate to face mask design, car seat design shoe-last design and footwear design. The paper by Krishnamurthy and Sen relates to the design of face mask using 3D head scans. Although, Krishnamurthy and Sen have discussed the statistical contour and shape of an aerosol mask, the proposed method can easily be extended to other products. This method of statistical shape development and evaluation is superior to percentile anthropometric measurement considerations. Franz et al. have discussed the development of a light weight car seat using human body contours. We can never underestimate the use of digital data in seat design. Xiao et al. have proposed an improved method for footwear fit assessment and shoe-last selection, while Au et al. have proposed a methodology for determining allowances for footwear fitting. Using both these papers, the footwear fit assessment, selection and design can be greatly improved. All of these papers have shown the wide range of products that can be designed using digital human models.

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