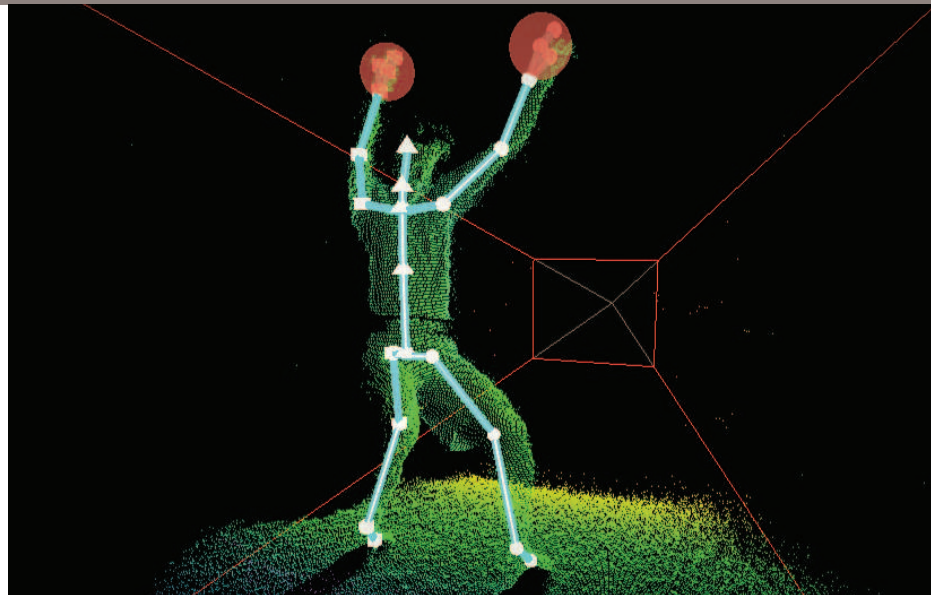


Smart Stadium: Understanding Human Motion Through Wearable Sensors



It is increasingly recognised that activity, exercise or more generally human movement, should form an integral part of most health interventions, (i.e. the promotion of higher intensity in daily activity or a requirement to perform a specific exercise movement as part of a rehabilitation programme). The desired outcome of any such intervention is to affect behavioural change in the target population. Behaviour change can only be enabled, however, by providing accurate, timely and appropriate feedback to the end user. Providing feedback on human motion presents a number of research challenges including:

- capturing biomechanically accurate motion outside a laboratory environment
- automatic classification and extraction of different actions within a movement sequence
- analysis and interpretation of motion data for each action
- communication of the analysis results
- suggesting modification/improvement back to the end user

The feedback to the end user depends upon a number of factors including the nature of the movement being measured, complexity of the action, user context and user experience. A further over-arching research challenge is that all of this should be accomplished in real-time (i.e. during a movement) or “near real-time” (i.e. immediately after a movement has been performed).

ASU's School of Computing, Informatics and Decision Systems Engineering and the Center for Cognitive Ubiquitous Computing (CUbiC) are collaborating with DCU's Insight Centre for Data Analytics on this project. The main areas of research centre around utilising body worn sensors to infer human movement. In parallel with visual feedback, haptic feedback is used to infer multimodal movement correction.



Dr. Troy McDaniel
Assistant Research Professor
School of Computing, Informatics
and Decision Systems Engineering
E: troy.mcdaniel@asu.edu
W: www.asu.edu



Dr. David Monaghan
Postdoctoral Research Fellow
Insight Centre for
Data Analytics
E: david.monaghan@dcu.ie
W: www.dcu.ie