Creating realistic character movement by studying human behaviour.

Imagine walking down a flight of stairs while reading a document and drinking a cup of coffee. You could easily do this without tripping or spilling any of the coffee. While this task poses no problem for most people, it is very challenging to have virtual characters behave similarly. Sander Jansen, a PhD-student for the GATE project, searches for the solution to this problem in understanding human behaviour.

Virtual characters have continued to improve their appearance ever since they were first introduced. Both their physical looks and their ‘intelligence’ seem to be very advanced. Their movements however still fall short. Think for instance of complex movements such as avoiding obstacles, walking down stairs or moving on a slippery surface. It is very difficult to generate these movements for games. Realistic character movement is by using full body motion capture. This technique allows for direct mapping of an actor’s movement onto a virtual character. Although this does generate believable behaviour, it is very time consuming and costly, since every specific movement needs to be recorded. For example, in order to have characters walking at different speeds, you need to record actors walking at each of these speeds. Another problem arises when additional recordings need to be made. The same actor has to be hired in order to get consistent animations.

Motion capture and biomechanical research in games

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Using motion capture as a measurement tool

Jansen and colleagues aim for a different approach, creating mathematical models of human movement. They do so by performing experiments with human participants, which allows them to investigate the effects of certain manipulations on human movement. The knowledge gained through these studies is combined in models that can reproduce and predict realistic behaviour by setting only a few parameters.

Motor Behaviour”. Sander Jansen works as a PhD for both Utrecht University and TNO Human Factors. He has a master’s degree in Cognitive Psychology and is especially interested in human optimization strategies during obstacle avoidance. His research is embedded in the GATE project “Modelling Motor Behaviour”. Sander can be reached at sander.jansen@tno.nl.