VICON

The dance of love
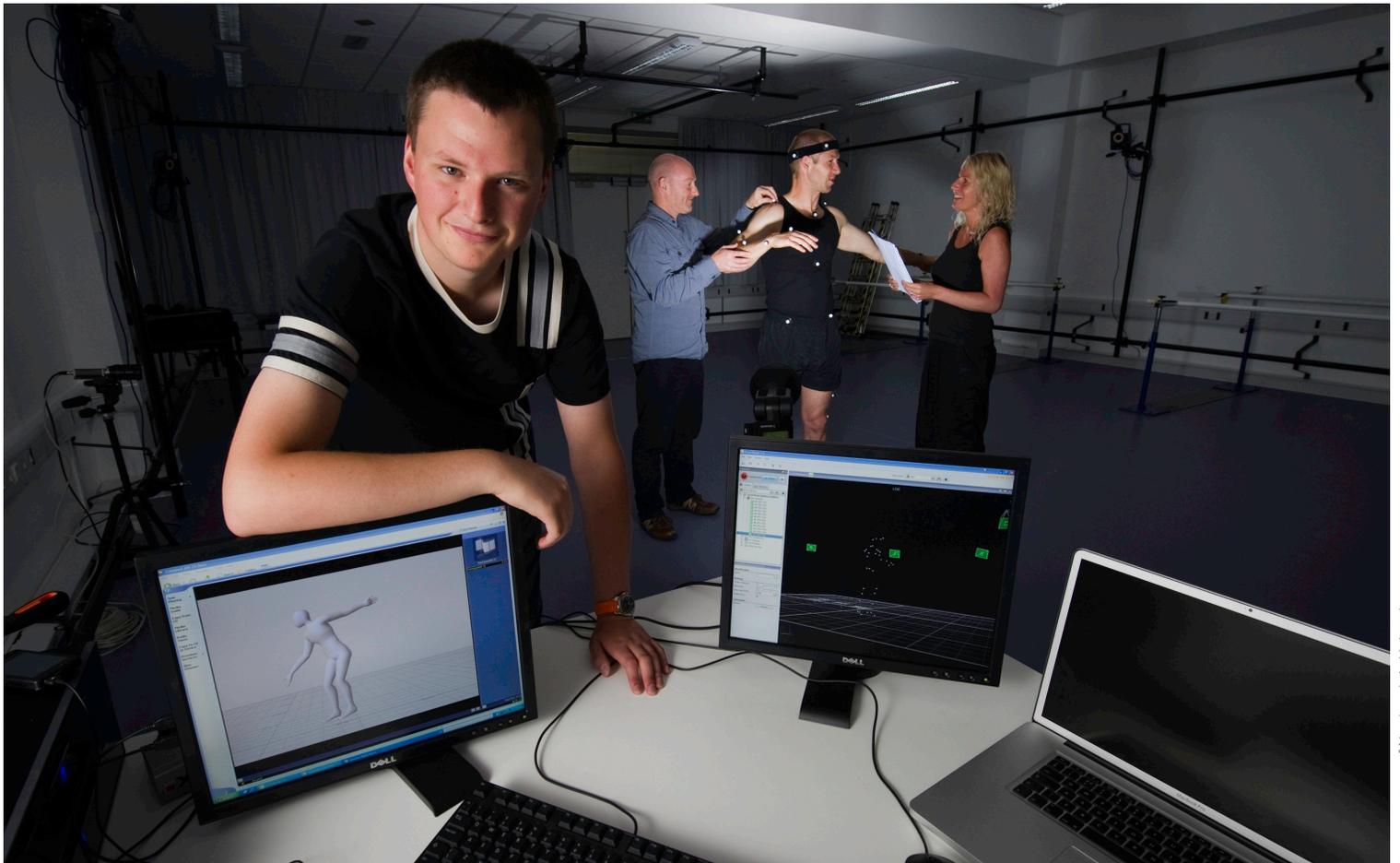## + Northumbria University

Image courtesy of Northumbria University

"By using Vicon technology we have been able to precisely break down and analyze specific motion patterns in male dancing that seem to influence perceptions of dance quality."
Dr. Nick Neave, Senior Lecturer in Psychology at Northumbria University.

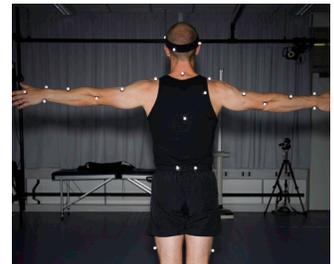Pioneering motion capture since 1984.

The dance of love
+ Northumbria University

Dancing avatar

Northumbria University

Northumbria University

Challenge

In 1859, Charles Darwin proposed that certain male traits evolved owing to sexual election via female mate choice. Some researchers have suggested that females evaluate males largely on the quality of their movements, especially those movements that contain elements of vigour or skill, because these are most likely to indicate health and genetic quality.

"Identifying the characteristics of attractive dance is difficult because of the confounding effects of facial attractiveness, height, clothing, dominance, body morphology and shape. Previous studies assessing women's perceptions of male dancing ability have attempted to control for these factors using blurred video clips or simple motion capture avatars," explained Dr. Nick Neave, Senior Lecturer in Psychology at Northumbria University.

Dr. Neave and colleague Dr. Nick Caplan wanted to improve on this methodology using motion capture to create more realistic 3D avatars from which, precise biomechanical measurements could be extracted.

Solution

To capture the subtle nuances needed to qualify 'good' or 'bad' dancing, researchers at Northumbria University needed a motion capture solution that was capable of gathering data at a sub-millimeter level.

The team set up a trial using 12 Vicon T20 motion capture cameras and Nexus software to analyze the dance moves of 19 male volunteers. Matlab was used to calculate the amplitude, speed, duration and variability of body movements. The analysis concentrated on three body regions: legs (ankle, hip and knee), arms (shoulder, elbow and wrist) and the central body (neck and trunk).

Dr. Caplan explains, "We attached 38 reflective markers to each of our 19 participants, using the Vicon Plug-in-Gait marker set to capture all of the major structures of the body. After calibration, our participants were asked to perform one 30 second dance to a constant core drum beat."

An avatar was built from each individual's motion capture data with Autodesk MotionBuilder. The avatar was then shown to 37 women to be rated for dance quality. The avatar chosen was a featureless, genderneutral humanoid character in order to put maximum emphasis on the biological movement and minimize attractiveness influencing the ratings.

"Using these avatars, the female participants rated dance quality on a seven-point Likert scale – one being an extremely bad dancer and seven being an extremely good dancer," explained Dr. Caplan.

Results

"To our knowledge, no previous studies have actually identified specific movement components within a dance that may influence perceived dance quality, a gap we aimed to fill in our study," said Dr. Neave.

"The accuracy of the Vicon system has helped us identify the specific movements within men's dance that influence women's perceptions of dancing ability."

Dr. Neave added, "By using cutting-edge Vicon T-Series technology, we have been able to precisely break down and analyze specific motion patterns in male dancing that seem to influence women's perceptions of dance quality."

Dr. Neave concluded, "We suggest that human male movements could form honest signals of traits such as health, fitness, genetic quality and developmental history. By uncovering some specific movement parameters used in the assessments of dance quality, we are now in a much stronger position to further research the possible signalling mechanisms of dance in humans."

This research has been published in the journal Biology Letters and a PDF of the paper can be obtained from the principal author (nick.neave@northumbria.ac.uk).

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