The Role of Motion Modeling in Digital Human Modeling for Proactive Ergonomics in Design

Don B. Chaffin
Keynote address at the 38th Annual Conference of the Association of Canadian Ergonomists, Toronto, Canada, October 14-17, 2007.

This paper presents the need to improve existing Digital Human Models DHMs so they are better able to serve as effective ergonomics analysis and design tools. Existing DHMs are meant to be used by a designer early in a product development process, when attempting to improve the physical design of vehicle interiors and manufacturing workplaces. The emphasis in this paper is placed on developing future DHMs that include valid posture and motion prediction models for various populations. It is argued that existing posture and motion prediction models now used in DHMs must be changed to become based on real motion data to assure validity for complex dynamic task simulations. It is further speculated that if valid human posture and motion prediction models are developed and used, these can be combined with psychophysical and biomechanical models to provide a much greater understanding of dynamic human performance and population specific limitations, and that these new DHM models will ultimately provide a powerful ergonomics design tool.