Enhancing a Traditional Ergonomics Tool With Capabilities and Algorithms From Immersive Environments

ABSTRACT: This paper presents our continuing work in approaches to link traditional, commercially available ergonomics evaluation tools with virtual environment tools for providing enhanced capabilities for engineering design. Ergonomic evaluation tools in engineering design are fairly mature and are used in important and specific ways to analyze human model postures in industry. The promising capabilities of immersive environment tools such as realistic environments and interactions, constraint-based modeling, and physically-based modeling are attractive to industry but have so far been available only in environments separate from the traditional ergonomics analysis tools. Our research seeks to create well-integrated synergistic approaches that will complement traditional ergonomics tools with a careful assimilation of capabilities and algorithms from a virtual environment. The information exchange, representations, communication, and computational issues involved in achieving this connectivity are discussed in this paper. We demonstrate this functionality between a commercial ergonomics tool and an immersive assembly system. It is anticipated that this synergy between an ergonomics tool and a virtual environment will lead to breakthroughs and ease of use benefits similar to those that have now been obtained by the close integration of CAD and virtual environments.