

## **Motor Control in Ergonomics: Applications in Human Computer Interfaces**

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With the goal of optimizing the performance and well-being of human based systems, ergonomics integrates multiple disciplines in interface design for such things as hand tools, work environments, and personal computing technology. Motor control as a discipline within ergonomics helps designers simulate and test the performance of interface designs through human digital modeling and it helps injury prevention efforts by identifying how interface design affects the loading of the musculoskeletal system. In terms of the human computer interface (HCI), the design of keyboards, the switches in keyboards and mice, as well as the work station layout and set up all effect performance and loading of the upper extremity. Within public health, our work has explored motor behavior patterns of the upper extremity determining the biomechanical load, a pathway to injury and how these patterns vary across different interface design configurations. Our initial studies examined finger motion and key-switch and mouse design. Current products incorporate the results of these studies. More recent efforts have focused on HCI work station design, such as forearm supports, software design, and individual motor behaviors, such as touch typing vs. two-finger typing. Our future work will incorporate motor learning approaches to design and develop interventions to reduce the biomechanical loading of the upper extremity through and in turn prevent computer-related musculoskeletal disorders.

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