Analysis and Simulation of Upper Body Motion of Patients Affected by Low Back Pain or Spinal Cord Injury

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An understanding of differences in movement patterns of people with back pain disability or spinal cord injuries and able-bodied persons may lead to more appropriate ergonomic workplace adaptation. The aim of the proposed work is to characterize and model functional limitations of these three groups of persons in reach and grip tasks. The participants performed reach and grip movements to spatially distributed targets in the frontal, lateral and overhead planes while seated. Empirical data (movement kinematics, 3D trajectories, subjective perception of effort, and EMGs) and modeling (statistical and optimization-based differential inverse kinematics models), are used to determine some limits of functional reach capability and movement strategies.

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