

Developing Models for Predicting Physiologically Impaired Arm Reaching Paths

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Abstract : This paper describes the development of a model of an impaired human arm performing a reaching motion, which will be used to predict hand path trajectories for people with reduced arm joint mobility. Assuming that the arm was in contact with a surface during the entire movement, the contact conditions at the initial and final task locations were determined and used to generate the entire trajectory. The model was validated by comparing it to experimental data, which simulated an arm joint impairment by physically constraining the joint motion with a brace. Future research will include using the model in the development of physical training protocols that avoid early recruitment of “healthy” Degrees-Of-Freedom (DOF) for reaching motions, thus facilitating an Active Range-Of-Motion Recovery (AROM) for a particular impaired joint.

Keywords : higher order kinematic specifications, human motor coordination, impaired movement, kinematic synthesis

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