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Virtual Human Joint Modeling and Predictive Dynamic Analysis Using Computational Simulation JAE YOUNG LEE, RICHARD KYUNG, Choice Research Group — In modern society, virtual human modeling and simulation has been an attraction for researchers. The new findings have influenced new designs and products in numerous fields. Predictive dynamics are used to create virtual simulations required to describe certain human motions and make physics related predictions. In this paper, human joint motions have been captured and analyzed using physical and computational simulation. This research virtually constructs a method that evaluates the effect of motion of human joint under a specific external loading. To test the method, two degrees of freedom serial chain mechanism with mass, damper, and spring constant have been used. Multibody system dynamics, embodying theories based on classical and analytical mechanics, are applied to interconnected mechanical systems. Since the use of dynamics of the mechanical human motions is an obstacle, simplification of the body joints has been made. Also, to further understand and solve this obstacle, numerical and vector computations are used. Predictive dynamics are describes as a second order ODE(Ordinary Differential Equations) solving the present algorithm. The mass of the system adheres to a spring and damper, and the system response with initial conditions has been calculated.

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