

## The Computer Simulation of Finger Rehabilitation

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### ABSTRACT

The study aims to prove the practicability of the algorithm for the optimal trajectory of fingers through computer simulated animation. Based on a 16-segment finger model (Chiu, 2006), this study adopted Lagrange-Euler equations of motion to design this dynamic system with 27 degrees of freedom. Next, the method of minimized acceleration was used to control the trajectory for finger movements. Then, the software edited with C<sup>++</sup> language was used to prove it. The results showed that under the established boundary conditions for motions of finger joints and limited time, the animation simulated in this study was capable of calculating the optimal motion trajectory for finger bending and stretching. Therefore, this algorithm, presenting vision feedbacks for finger movements, could be applied to the teaching of finger rehabilitation as well as controlling the optimal trajectory for rehabilitation motions of robotic fingers.

**Keyword: algorithm, Lagrange-Euler equations**