

Chaotic motion of a triple physical pendulum model analysis of biomechanics as arm movement using tracker

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Abstract. This research aimed to present the human arm movement as badminton motion by using a triple physical pendulum model for propose of the up-down swing of human arms. Human arms have three segments, contacted together via joints; such as the three links of the rod masses of the triple physical pendulum swing when playing badminton that can use the Euler-Lagrange equation and tracker physics to analyse the system. The dynamics analysis of the system motion at θ_1 , θ_2 and θ_3 equal 180° , the results showed chaotic oscillation motion at the end of the third rod, which was linear velocity, angular velocity, angular acceleration and the kinetic energies of the triple physical pendulum.

Keyword: triple physical pendulum; biomechanics; arm movement