

Load Maximization of Two-Link Flexible Manipulator Using Suppression Vibration with Piezoelectric Transducer

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Abstract : In this paper, the energy equations of a two-link flexible manipulator were extracted using the Euler-Bernoulli beam hypotheses. Applying Assumed mode and considering some finite degrees of freedom, we could obtain dynamic motions of each manipulator using Euler-Lagrange equations. Using its claws, the robots can carry a certain load with the ached control of vibrations for robot flexible links during the travelling path using the piezoceramics transducer; dynamic load carrying capacity increase. The traveling path of flexible robot claw has been taken from that of equivalent rigid manipulator and coupled; therefore to avoid the role of Euler-Bernoulli beam assumptions and linear strains, material and physical characteristics selection of robot cause deflection of link ends not exceed 5% of link length. To do so, the maximum load carrying capacity of robot is calculated at the horizontal plan. The increasing of robot load carrying capacity with vibration control is 53%.

Keywords : flexible link, DLCC, active control vibration, assumed mode method

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