

عنوان مقاله:

Position control of six-DOF Stewart mechanism using the sliding mode control

محل انتشار:

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خلاصه مقاله:

In this paper, we investigated the sliding mode controller for six degrees of freedom (6-DOF) Stewart mechanism. The design of mechanical systems in order to move loads precisely and with high accuracy is of the most important subjects in robotics. Nowadays, the use of skilled robotic arms has a many different applications, however in all the applications there are important tips in the designing including simple structure, optimized energy consumption, obtaining high speed and acceleration for the final executer, simple implementation of controlling law, and the ability of system to following the path in the future, adequately. In the current paper, kinematic, dynamic, and controlling a parallel mechanism based on Stewart platform, have been investigated. For the dynamic of Stewart robot, the method of virtual work principle is used, which is more accurate and has less computational volume compared to the other methods. The sliding mode control is a nonlinear controlling method, which ensures the control strategy against uncertainties. In this method, stabilities are achieved by keeping the system states on the sliding surface. Results of the simulation are also indicating that this controller is able to maintain its stability against uncertainties, perfectly, and the final executer follows the final path as well.

کلمات کلیدی:

Stewart Mechanism, Sliding Mode Control, the Principle of Virtual Work, Chattering

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