PAIRAT TANGPORNPRASERT : HYBRID FORCE-POSITION CONTROL OF A ROBOT MANUPULATOR ARM. THESIS ADVISOR : ASSO. PROF. VIBOON SANGVERAPHUNSIRI, Ph.D. 85 pp. ISBN 974-636-729-3

The controller for hybrid force-position control is studied in this thesis and implemented on the Chula II manipulator arm. The resolved-acceleration control is used for position control. For the force control, the real-time computation of the derection of force on the contacted surface is used to find the compliance frame so that the motion can be generated.

The experiments will diveded into 3 parts. The first part covers the position control. The results, for the linear motion of the robot tip, show the very acceptable position trackings. The second part covers the force control without the end point motion. The refereced force signals are step, trapezoid and sine function. There is some fluctuation of the controlled force. But the outputs have tendency to converge to the referece signals.

The final part covers both force and position controls. The robot tip is controlled to follow a smooth plane surface and a cylindrical surface. The trapezoidal force and velocity command signals are used as the referenced signals. The position command signal can be generated from the velocity command. The results shown that, because of the friction between the robot tip and the surface, the higher the cammand force, the higher the position error. The backlash and the flexibilities of the robot arm are the main effects of the fluctuation of the controoled force especially at the discontinuity point of the reference signals.

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