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Research Article

Intelligent Hybrid Control Strategy for Trajectory Tracking of Robot Manipulators

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Abstract

We address the problem of robust tracking control using a PD-plus-feedforward controller and an intelligent adaptive robust compensator for a rigid robotic manipulator with uncertain dynamics and external disturbances. A key feature of this scheme is that soft computer methods are used to learn the upper bound of system uncertainties and adjust the width of the boundary layer base. In this way, the prior knowledge of the upper bound of the system uncertainties does not need to be required. Moreover, chattering can be effectively eliminated, and asymptotic error convergence can be guaranteed. Numerical simulations and experiments of two-DOF rigid robots are presented to show effectiveness of the proposed scheme.

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