عنوان مقاله:

Bilateral Teleoperation Systems Using Backtracking Search optimization Algorithm Based Iterative Learning Control

نویسنده:

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خلاصه مقاله:

This paper deals with the application of iterative learning control (ILC) to further improve performance of bilateral telerobotic systems based on Smith predictor. The aim is to achieve robust stability and optimal transparency for these systems simultaneously. The proposed control structure makes the slave manipulator follow the master in spite of uncertainties in time delays appeared in communication channel and model parameters of master-slave robots, called model mismatch. The time delays are considered to be large, unknown and asymmetric, but the upper bound of the delay is assumed to be known. The main aspect of the proposed controller is that a designer can use the classical controller like proportional-integrator-derivative (PID). However, one of its main difficulties is how to assign proper parameter values for the controller. In other words, the parameters of the controller are not unique and are chosen only to satisfy the stability condition. To solve this problem, in this paper, the local controller is also optimized by backtracking search optimization algorithm (BSA), which is a novel heuristic algorithm with a simple construction. Simulation results illustrate the appropriate performance of the proposed controller.

کلمات کلیدی:

Telerobotic, Transparency, Iterative Learning Control, Smith Predictor Optimization

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