عنوان مقاله:

Simulation and design of ۲-DOF hybrid genetic algorithm optimized fuzzy controller

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it necessitates that the controllers designed for such system must overcome these complexities. In this paper, we develop a novel fractional order fuzzy pre-compensated fractional order PID (FOFP-FOPID) controller for ۲-degree of freedom (۲-DOF) manipulator dealing with trajectory tracking problem. In order to optimize the controller's parameters while minimizing integral of time absolute error (ITAE), a metaheuristic optimization technique, viz., artificial bee colony-genetic algorithm (ABC-GA) is presented .The efficacy of our proposed controller is demonstrated by comparing it with some existing controllers, such as integer order fuzzy pre-compensated PID (IOFP-PID), fuzzy PID (FPID), and conventional PID controllers. Furthermore, the robustness analysis for proposed controllers is also investigated for parameter variations and external disturbances. The simulation results indicate that FOFPFOPID controller can not only guarantee the best trajectory tracking but also ameliorate the system robustness for parameter variations as well as external disturbances

کلمات کلیدی:

Fuzzy PID controller; Fuzzy logic controller; Fractional order controller;genetic algorithm