نویسنده:
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خلاصه مقاله:

Abstract— One of the main problems underlying most optimization theories is local optimum. When time delays are presented, this issue becomes much more problematic. In such conditions, evolutionary optimization algorithms are proven to be helpful. In this paper, quantum genetic algorithm (QGA) has been used to tackle the stated problem in the framework of delay-dependent linear matrix inequality (LMI) robust H∞ control. QGA is employed to find suitable feedback gains and delay-dependent LMI solvers are concerned to resolve stability issues. In addition, to provide more balance between exploration and exploitation, to increase convergence rate as well as to prevent premature convergence, it is proposed that particle swarm optimization (PSO) is augmented with QGA. Simulation is dealt with LMI-based H∞ control scheme of the QGA and QGA-PSO optimization space from the design point of one-degree freedom single link scara robot. The whole controller satisfies the desired properties for uncertain-but-known constant bounded time delay. Furthermore, one of the drawbacks found in tests of most hybrid global-local strategies, i.e. premature convergence, has been cancelled by the proposed scheme of QGA and PSO.

کلمات کلیدی:
H∞ control, Linear matrix inequality (LMI), Quantum genetic algorithm (QGA), Time Delay

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