A Particle Swarm Optimization Approach for Optimum Design of First-Order Controllers in TCP/AQM Network Systems

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Abstract

This paper proposes a Particle Swarm Optimization (PSO) method for determining the optimal parameters of a first-order controller for TCP/AQM system. The model TCP/AQM is described by a second-order system with time delay. First, the analytical approach, based on the D-decomposition method and Lemma of Kharitonov, is used to determine the stabilizing regions of a first-order controller. Second, the optimal parameters of the controller are obtained by the PSO algorithm. Finally, the proposed method is verified and compared with the PI controller using the Network Simulator, NS-2.

References


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**Index Terms**

Computer Science  
Control Systems

**Keywords**

Time Delay  Tcp/aqm  Ps o