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基于结构奇异值的网络化水电机组鲁棒控制

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摘要
考虑到网络化控制系统中的通信延迟会影响被控系统的稳定性，本文依据鲁棒控制理论将传感器、执行器以及控制器之间的不确定延迟采用乘摄动模型来表示，使得控制器可以用鲁棒控制理论来求解。由于m 综合理论能兼顾稳定鲁棒性和性能鲁棒性，因此控制器采用m 综合理论来求解。最后采用本文方法利用SIMULINK对一个实际的水电机组进行了仿真分析，结果表明该方法可以有效抑制延迟对系统稳定性的影响。

关键词 水电机组；网络化控制系统(NCS)；鲁棒控制；延迟

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Research on Structured Singular Value Based Networked Robust Control for Hydroturbine Unit

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Abstract
Considerting the affect of communication delay in networked control system (NCS) on the stability of the controlled system, based on robust control theory the authors expresses the uncertain delay among sensor, actuator and controller by multiplicative perturbation model. It makes the controller enable to be solved by robust control theory. Because m synthesis theory possesses both stability robustness and performance robustness, so the controller is solved by m synthesis theory. Using the proposed method and Simullink software, a practical hydroturbine unit is simulated. Simulation results show that the proposed method can effectively restrain the affect of communication delay on system stabilty.

Key words hydroturbine unit；networked control system (NCS)；robust control；time delay

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