

不确定时变时滞模糊大系统的采样分散可靠 H_∞ 双曲控制

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摘要

研究了时变时滞不确定连续模糊大系统的采样可靠双曲控制. 首先对一类复杂大系统进行模糊双曲建模, 然后根据李亚普诺夫直接方法和大系统的分散控制理论, 得出了基于线性矩阵不等式的条件, 该条件不仅所有控制元件都有效工作时, 而且在执行器可能存在故障的情况下都能保证系统的性能. 且不需要执行器的精确故障参数, 只需要故障参数的上下界. 该条件只依赖于时滞的上界, 不依赖于时变时滞的导数. 因此得到的条件有更小的保守性. 最后应用两个例子验证了设计过程及其有效性.

关键词 [模糊双曲模型](#) [采样控制](#) [可靠控制](#) [大系统](#) [时变时滞](#)

分类号

Sample-data Decentralized Reliable H_∞ Hyperbolic Control for Uncertain Fuzzy Large-scale Systems with Time-varying Delay

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Abstract

This paper studies the problem of sampled-data reliable H_∞ hyperbolic control for uncertain continuous-time fuzzy large-scale systems with time-varying delay. Firstly, the fuzzy hyperbolic model (FHM) is used to establish the model for certain complex large-scale systems, then according to the Lyapunov direct method and the decentralized control theory of large-scale systems, linear matrix inequalities (LMIs)-based conditions are derived to guarantee the H_∞ performance not only when all control components are operating well, but also in the presence of some possible actuator failures. Moreover, the precise failure parameters of the actuators are not required, and the requirements are only the lower and upper bounds of failure parameters. The conditions are dependent on the upper bound of time-delay, and not dependent on the derivative of time-varying delay. Therefore, the obtained results are less conservative. Finally, two examples are provided to illustrate the design procedure and its effectiveness.

Key words [Fuzzy hyperbolic model \(FHM\)](#) [sample-data \$H_\infty\$ control](#) [reliable control](#) [large-scale systems](#) [time-varying delay](#)

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