

[2008-1025]Control of Spatially Interconnected Systems with Random Communication Losses

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摘要

关键词

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[2008-1025]Control of Spatially Interconnected Systems with Random Communication Losses

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Abstract

This paper deals with analysis and synthesis problems of spatially interconnected systems where communicated information may be lost between subsystems. The spatial shift operator as well as the temporal forward shift operator is introduced to model the interconnected systems as discrete time-space multidimensional linear systems with Markovian jumping parameters which reflect the situation of communication channels. An analysis condition is obtained to ensure the whole systems well-posed and mean square stable for a given packet loss rate. Then a procedure of designing distributed dynamic output feedback controllers is proposed. The controllers have the same structure as the plants and are solved within the linear matrix inequality framework. Finally, we apply these results to study the effect of communication losses on the multiple vehicle platoon control system, which further illustrates the effectiveness of the proposed model and method.

Key words [Spatially interconnected systems](#) [communication losses](#) [Markovian jump linear systems](#) [linear matrix inequalities](#)

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