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Passive control synthesis for uncertain systems with multiple-state delays. (English)

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Summary: We investigate the robust passivity synthesis problem for a class of uncertain systems with multiple state delays. Both the delay-independent and the delay-dependent cases are treated. In each case, a sufficient condition for which the uncertain multi-state delay system is robustly stable and strictly passive (SP) for all admissible uncertainties is provided in terms of a linear matrix inequality. Then, we propose a dynamic feedback design methodology based on either state measurements or output measurements. For both types of controllers, it is proven that the closed-loop uncertain time-delay system is asymptotically stable and SP for all admissible uncertainties. A detailed simulation example is given to illustrate the theoretical developments.

MSC:

93B50 Synthesis problems

Keywords:

passive control; uncertain systems; state delays

Software:

LMI toolbox

Full Text: DOI