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Maximum allowable delay bound estimation using Lambert W function (Conference Paper)

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Abstract

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The widespread of communication networks make them very promising to play a great role in future control systems. The communication networks will be present in the feedback control system which makes it a kind of time delay system. Closing the feedback system through a communication network introduces many challenges for the controller designers. Communication networks induce inherent time delay and some of the data may be lost which can destabilize the control system or result in poor system performance. It is important to identify the maximum time delay that the control system can withstand. In this paper, we report the application of the Lambert W function for calculating the maximum allowable delay bound in linear time delay control systems. The results of the calculation are compared with the most widely used Linear Matrix Inequalities based method. © 2017 IEEE.

Author keywords

Delay | Lambert W function | LMI | MADB | Maximum allowable delay bound | Networked control system | Time delay

Indexed keywords

Engineering controlled terms: Adaptive control systems | Feedback control | Linear matrix inequalities | Networked control systems | Telecommunication networks | Time delay

Engineering uncontrolled terms: Delay | Feedback systems | Lambert W function | Linear time delays | MADB | Maximum allowable delay bound | Time-delay systems

Engineering main heading: Delay control systems

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