Control of Distributed Delay Systems with Uncertainties: A Generalized Popov Theory Approach.

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Abstract: The paper deals with the generalized Popov theory applied to uncertain systems with distributed time delay. Sufficient conditions for stabilizing this class of delayed systems as well as for γ-attenuation achievement are given in terms of algebraic properties of a Popov system via a Liapunov–Krasovskii functional. The considered approach is new in the context of distributed linear time-delay systems and gives some interesting interpretations of H^∞ memoryless control problems in terms of Popov triplets and associated objects. The approach is illustrated via numerical examples.

DEDICATED TO ACAD. VLAD IONESCU, IN MEMORIAM.

Keywords:

AMS Subject Classification: