Robustness of exponential stability of a class of switched positive linear systems with time delays

L. V. Ngoc

Abstract:

In this talk, we study the the robustness of exponential stability of a class of positive switched systems described by linear functional differential equations (FDE) under arbitrary switching or average dwell time switching. We will measure the stability robustness of such a system (which is considered as a nominal system) subject to parameter affine perturbations of its constituent subsystems matrices, by introducing the notion of structured stability radius. Some formulas for computing this radius, as well as estimating its lower bounds and upper bounds, are established. The extension of the obtained results to non-positive systems and the class of multi-perturbations has been presented. Examples are given to illustrate the proposed method.

Department of Scientific Fundamentals,
Posts and Telecommunications Institute of Technology
Office A2, Fl.10, 96A Tran Phu Street, Ha Dong District, Hanoi, Vietnam
ngoclv@ptit.edu.vn or lvngocmath2025@gmail.com