

Structured Lyapunov Functions and Dissipativity in LTI dynamical networks

Ivica Nakić

University of Zagreb

Faculty of Science Department of Mathematics

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Abstract

In this talk I will address connections between Lyapunov functions of a class of dynamical networks and dissipativity properties of individual systems. I will give a short review of the basic concepts used for studying stability of dynamical networks and relate dissipativity properties of individual systems in a network with existence of a structured Lyapunov function with certain robustness properties. Furthermore, I will introduce the notion of differential supply rates and derive novel structured stability conditions based on storage functions with higher order derivatives.