

3rd International Conference on Advanced Systems and Emergent Technologies (IC_ASET'2019)

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SPECIAL SESSION

on

LMI for Advanced Control and Observer Design

Linear Matrix Inequalities (LMIs) become more and more a power tool with constant evolution in control design theory and applications. This is due to their simplicity from theoretical point of view, and they are numerically tractable by using new and useful softwares, such as Matlab LMI toolbox, for instance. This special session deals with LMIs and their role in advanced control.

LMIs have played a key role in both stability analysis and control and observer synthesis for linear and nonlinear systems. It has been shown that using Lyapunov function-based methods, the stability and stabilization problems of dynamical systems are expressed in terms of Bilinear Matrix Inequalities (BMIs), which are complex enough to be solved numerically. Hence, several methods have been developed for the transformation of these BMIs into LMIs. However, in some stabilization problems, as, e.g., in the static/dynamic output feedback control problem and the observer-based feedback control problem, the linearization procedure of these BMIs is not easy. Several approaches have been established in the literature but all the proposed methods remain conservative and seem possible to be enhanced.

The problem of advanced control and observer design via LMIs still a challenge and the investigations are to be deepened to improve the actual techniques. The purpose of this special session is to provide an opportunity for scientists and practitioners to propose their theoretical methods in the design of LMIs to synthesize advanced controls.

Keywords:

LMI; BMI; Static/dynamic output feedback control; Observer-based feedback control; Observer design; Sliding mode control; Fault diagnosis; Fault-tolerant control; ADRC; ...

Note:

Presented papers with an extended version will be submitted for possible publication in a special issue of a Scopus- and ESCI-indexed journal.

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