



3rd IFAC Conference on Embedded Systems, Computational Intelligence
and Telematics in Control (CESCIT 2018)

4-6 June 2018

<http://www.cescit2018.org>

Open Invited Track on:

Fuzzy-inspired convex analysis and control of nonlinear systems

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Abstract: For years, model-based fuzzy control (MBFC) methodologies have been paralleled by the developments for analysis and control of linear parameter varying (LPV) systems; eventually, both areas nurtured each other with enriching points of view, solving problems that benefited both of them. More recently, the two areas have merged as a single one concerned with the exploitation of convex modeling (Takagi-Sugeno (TS) systems, for instance) and convex optimization techniques (especially linear matrix inequalities (LMIs) and sum of squares (SOS)), regardless of its fuzzy or LPV origin. Within these methodologies, improvements are still on course in several directions: better modeling with respect to some performance measure, wider Lyapunov-based control/observation/output feedback schemes, for uncertain/nonlinear/time-delay/hybrid/discrete-time systems. Moreover, these methodologies are conquering and providing insights to other areas which were not traditionally associated with them: singular systems, sliding modes, chaos, synchronization, fractional-order, polynomial-based analysis, etc. The session intends to cover advances on these topics, which represent an important field of the TC 3.2, Computational Intelligence in Control.



IFAC technical committee(s) for evaluation:

Technical Committee 3.2: “Computational intelligence in Control” (Chair Thierry-Marie Guerra)

Detailed description:

Understanding there will be at least some part of convex modeling or optimization, the main topics of this special session include, but are not limited to:

- Quasi-LPV / Takagi-Sugeno fuzzy systems
- Convex Inclusions, Linear Convex Inclusions, Quasi-Convex Convex Inclusions
- LPV systems / Uncertain systems
- Hybrid systems
- Switching systems
- Time-delay systems
- Stochastic systems
- Polynomial systems
- Convexity and the direct Lyapunov method in stability analysis
- Convexity and control law design
- Predictive control
- Robust control
- Sampled-data control
- Filtering