

## Recent advances in fuzzy control: theory and applications

Zsófia Lendek \* Kevin Guelton \*\*

\* *Department of Automation, Technical University of Cluj-Napoca,  
Memorandumului 28, 400114 Cluj-Napoca, Romania. (e-mail:  
zsofia.lendek@aut.utcluj.ro)*

\*\* *CRéSTIC, EA3804, URCA, Université de Reims  
Champagne-Ardenne, Moulin de la House BP1039, 51687 Reims Cedex  
2, France (e-mail: kevin.guelton@univ-reims.fr)*

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**Abstract:** The aim of this open invited track is to present state-of-the-art results in the area of theory and applications of fuzzy-model-based control design and analysis at large, and to get together well-known and potential researchers in this area. Fuzzy-model-based control provides a systematic and efficient approach to the analysis and control of nonlinear systems. It has been employed to deal with a wide range of nonlinear control systems such as continuous-time, discrete-time, hybrid, sampled-data, time-delay, switching, adaptive control systems and so on. However, there is still room for improvement of the existing results in order to propose new techniques for control. This open invited track focuses mainly on the fuzzy-model-based control systems and analysis with emphasis on the theory and applications. The important problems and difficulties on the fuzzy-model-based control systems will be addressed, its concepts will be provided and methodologies will be proposed to handle nonlinear systems using fuzzy-model-based control approaches. The session will cover classical Takagi-Sugeno and polynomial fuzzy models for stability, control and estimation, representing an important field of the TC 3.2, Computational Intelligence in Control.

The main topics of this open invited track include, but are not limited to:

- Takagi-Sugeno fuzzy control system
- Uncertain fuzzy system
- Fuzzy hybrid system
- Fuzzy switching system
- Fuzzy time-delay system
- Fuzzy stochastic system
- Fuzzy polynomial system
- Stability analysis of fuzzy systems
- Nonlinear control design based on fuzzy systems
- Predictive control
- Robust control
- Sampled-data control
- Filtering

*Keywords:* Fuzzy control, Takagi-Sugeno models, Fuzzy modeling, Lyapunov functions, Fuzzy applications

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