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AUTOMOTIVE APPLICATIONS OF EVOLVING TAKAGI-SUGENO-KANG FUZZY MODELS

Radu-Emil Precup, Stefan Preitl, Claudia-Adina Bojan-Dragos, Mircea-Bogdan Radac, **Alexandra-Iulia Szedlak-Stinean**, Elena-Lorena Hedrea, Raul-Cristian Roman

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Abstract

This paper presents theoretical and application results concerning the development of evolving Takagi-Sugeno-Kang fuzzy models for two dynamic systems, which will be viewed as controlled processes, in the field of automotive applications. The two dynamic systems models are nonlinear dynamics of the longitudinal slip in the Anti-lock Braking Systems (ABS) and the vehicle speed in vehicles with the Continuously Variable Transmission (CVT) systems. The evolving Takagi-Sugeno-Kang fuzzy models are obtained as discrete-time fuzzy models by incremental online identification algorithms. The fuzzy models are validated against experimental results in the case of the ABS and the first principles simulation results in the case of the vehicle with the CVT.

Keywords

Automotive Applications, Anti-lock Braking Systems, Continuously Variable Transmission Systems, Dynamics, Evolving Takagi-Sugeno-Kang Fuzzy Models

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