

Design of a Fuzzy Luenberger Observer for Fault Nonlinear System

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Abstract : We present in this work a new technique of stabilization for fault nonlinear systems. The approach we adopt focus on a fuzzy Luenberger observer. The T-S approximation of the nonlinear observer is based on fuzzy C-Means clustering algorithm to find local linear subsystems. The MOESP identification approach was applied to design an empirical model describing the subsystems state variables. The gain of the observer is given by the minimization of the estimation error through Lyapunov-Krasovskii functional and LMI approach. We consider a three tank hydraulic system for an illustrative example.

Keywords : nonlinear system, fuzzy, faults, TS, Lyapunov-Krasovskii, observer

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