Design of a Fuzzy Luenberger Observer for Fault Nonlinear System

Authors : Mounir Bekaik, Messaoud Ramdani

Abstract : We present in this work a new technique of stabilization for fault nonlinear systems. The approach we adopt focus on a fuzzy Luenverger 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
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020