

Adaptive weighted minimum variance control for stochastic fuzzy ARMAX  
models

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Abstract

In this study, we attack the weighted adaptive minimum variance control for stochastic T-S fuzzy ARMAX models. From the fuzzy ARMAX model, a fuzzy one-step ahead prediction model is first developed. A stochastic gradient algorithm is then proposed to identify the parameters of the related one-step-ahead predictor. Under the direct adaptive control scheme, the weighted minimum variance control is applied to find the control law to make adaptive control system stable in the sense of mean square stability. Stability of the adaptive stochastic fuzzy control system is rigorously derived.

Keyword : System identification, parameter estimation, T-S fuzzy ARMAX model, adaptive fuzzy control