Adaptive minimum variance control for stochastic fuzzy T-S ARMAX models

李柏坤,邱家宏,陳博現
Electrical Engineering
Engineering
bklee@chu.edu.tw

Abstract

Adaptive minimum variance control for stochastic T-S fuzzy ARMAX model is addressed in this study. From the fuzzy ARMAX model, a fuzzy one-step ahead prediction model is first introduced. A stochastic gradient algorithm is then proposed to identify the parameters of the related one-step-ahead predictor. Under the direct adaptive control scheme, minimum variance control is applied to find the control law to make the output track a desired reference signal. Stability and performance of the adaptive stochastic fuzzy control system are rigorously derived. Simulation study is also made to verify the developed results.

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