

ANFIS: Self-tuning Fuzzy PD Controller for Twin Rotor MIMO System

ABSTRACT

This work presents a self-tuning fuzzy PD controller for solving the control challenges of twin rotor MIMO system. The controller is made adaptive through output scaling factor adjustment of the updating factor, λ . The value of λ is calculated directly from a fuzzy rule base defined as error and change of error of the controlled variable. A combination of adaptive neural fuzzy inference system and fuzzy subtractive clustering method was used, where the objective was to improve its time response, while reducing its computational complexity. Simulation results show performance improvement in comparison with that of the previous method. Copyright © 2010 Institute of Electrical Engineers of Japan. Published by John Wiley & Sons, Inc.

Keyword: twin rotor MIMO system, self-tuning fuzzy PD controller, ANFIS, fuzzy subtractive clustering method