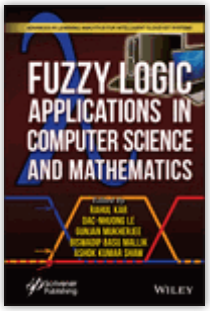

Fuzzy Logic Applications in Computer Science and Mathematics

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About this book

FUZZY LOGIC APPLICATIONS IN COMPUTER SCIENCE AND MATHEMATICSTICS

The prime objective of developing this book is to provide meticulous details about the basic and advanced concepts of fuzzy logic and its all-around applications to different fields of mathematics and engineering.

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CHAPTER 17

A Comprehensive Review and Analysis of the Plethora of Branches of Medical Science and Bioinformatics Based on Fuzzy Logic (Pages: 267-278)

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Fuzzy Logic Applications in Computer Science and Mathematics

Chapter 7

Design of Type-2 Fuzzy Controller for Hybrid Multi-Area Power System

Susmit Chakraborty, Arindam Mondal, Soumen Biswas

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Summary

In this chapter, a new fuzzy method named as interval type-2 fuzzy inference systems (IT2FIS) is proposed along with Fractional order PID (FOPID) controller to control tie-bar power error and frequency error of power system containing multi area. Two area system containing conventional as well as non-conventional sources like solar-thermal and wind-hydroelectric systems are studied in this chapter. Type-2-fuzzy parameters are trained by Levenberg–Marquardt algorithm (LMA). A comparison is done for the responses of the systems when controlled by PID-type-2-fuzzy combined controller and FOPID-type-2-fuzzy combined controller. PID parameters (Kp, Ki, Kd) are optimized using metaheuristic Chaotic Atomic Search Optimization (CASO) algorithm. Simulation results are analysed though the obtained parameters such as settling time, overshoot and undershoot when the system is controlled by both the complex controllers with and without disturbances and the same is compared with the results obtained using conventional PID controller. The mathematical formulations along with the simulation results are illustrated using MATLAB to prove the efficacy of the proposed controller design methodology for hybrid multi-area power system using type-2 fuzzy FOPID controller.

References