

CHAPTER 54
TECHNOLOGY
INSTRUMENTATION AND CONTROL
ENGINEERING

Doctoral Theses

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Modeling and Control of Nonlinear Systems using Fuzzy Logic (Type-2) Based Intelligent Tools.
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Abstract

Deals with type-2 models which include type-2 fuzzy sets and type-2 networks for the identification and control of nonlinear systems. Type-2 models, Lyapunov and fuzzy difference equation based learning scheme is developed. This learning methods assures the stability and plasticity of the system. Further improvement in the learning scheme is achieved through the converging and diverging algorithms. Proposed type-2 models with Lyapunov and fuzzy difference equation based learning algorithm are well tested on benchmark problems of identification and control. In addition, the real implementation of the proposed interval type-2 models as controllers has been carried out on the pressure feedback system.

Contents

1. Some issues in type-2 fuzzy modelling and control. 2. Formulation of higher order fuzzy system. 3. modeling of type-2 fuzzy systems. 4. A new learning scheme for type-2 fuzzy systems. 5. Design of type-2 fuzzy sets based controllers. 6. Design of type-2 networks. 7. Real time implementation of type-2 systems as controllers. 8. Conclusions. 9. References.