DESCRIPTION

A comprehensive treatment of model-based fuzzy control systems

This volume offers full coverage of the systematic framework for the stability and design of nonlinear fuzzy control systems. Building on the Takagi-Sugeno fuzzy model, authors Tanaka and Wang address a number of important issues in fuzzy control systems, including stability analysis, systematic design procedures, incorporation of performance specifications, numerical implementations, and practical applications.

Issues that have not been fully treated in existing texts, such as stability analysis, systematic design, and performance analysis, are crucial to the validity and applicability of fuzzy control methodology. Fuzzy Control Systems Design and Analysis addresses these issues in the framework of parallel distributed compensation, a controller structure devised in accordance with the fuzzy model.

This balanced treatment features an overview of fuzzy control, modeling, and stability analysis, as well as a section on the use of linear matrix inequalities (LMI) as an approach to fuzzy design and control. It also covers advanced topics in model-based fuzzy control systems, including modeling and control of chaotic systems. Later sections offer practical examples in the form of detailed theoretical and experimental studies of fuzzy control in robotic systems and a discussion of future directions in the field.

Fuzzy Control Systems Design and Analysis offers an advanced treatment of fuzzy control that makes a useful reference for researchers and a reliable text for advanced graduate students in the field.
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