CHAPTER 55

TECHNOLOGY
ELECTRICAL ENGINEERING

Doctoral Theses

555.   BHUSHAN (Bharat)
       Investigations on Intelligent Control of Nonlinear Systems.
       Supervisor : Prof. Madhusudan Singh
       <u>Th 18972</u>

Abstract

Investigates modeling, analysis, identification & control of a class of nonlinear SISO and MIMO systems are more complex and not generalised. Analytical and graphical methods available for nonlinear systems analysis are effective and accurate to a particular class/structure of the nonlinear systems. The nonlinear systems which could be represented in a feedback form and whose dynamical behaviours are modified through, control inputs have been considered for analysis through intelligent control techniques. The efforts have been made to carry out a comparative analysis of multilayer perceptron (MLP), Elman, nonlinear autoregressive network with exogenous input series parallel network (NARXSP) and RBF artificial neural networks on dynamical performance of DC servo motor and benchmark nonlinear system.

Contents

1. Introduction. 2. Literature survey. 3. Identification and control using neural networks. 4. Takagi-sugeno fuzzy system based stable adaptive control. 5. Intelligent control of indirect vector control induction motor. 6. Metaheuristic algorithms based adaptive control. 7. Coclusion and further scope of work. 8. References. 9. Appendices.

556. MANISH KUMAR
Nonlinear Pattern Analysis with Specific Applications to Evaluation of Power Quality.
Supervisor : Dr. Rajiv Kapoor
Th 18973

Abstract

Analyses the pattern and statistically matched filter, 2D compression algorithm and 2D enhancement algorithm have been designed and implemented. The design of matched filter has been proposed in the statisical sense. The designed matched filter has been utilized for the speaker recognition. Optimization based vector quantization has been proposed which performs better than the techniques available in the literature. Optimization based enhancement of 2D pattern has also been proposed in the special domain.

Contents

1. Overview of power quality. 2. Nonlinear analysis of pq events. 3. Detection and tracking of pq disturbances using modified potential fuction. 4. Multiwavelet based classification of pq events. 5. Demodulation concepts and harmonic analyzer for pq analysis. 6. Bi-wavelants based detection and classification technique for pq disturbance. 7. Power system fault disturbance recognition. 8. Design of fractionally delayed wavelet for pq analysis. 9. Quadratic approximations based mitigation technique for pq disturbances implemented on tms320c52. 10. Analysis of other patterns. 11. Conclusions and future research. 12. References.

557. TUSHIR (Meena)
Soft Computing Based System Modeling Identification and Control.
Supervisor : Prof. Smriti Srivastava
Th 18974

Abstract

Describes soft computing approaches for the modeling and control of complex dynamic systems as soft computing offers an olive branch to the evils of these systems. The application of soft computing in this work has resulted in the components of modeling and control like structure determination and model/controller learning.

Contents

1. Issues in soft computing. 2. Clustering analysis. 3. Structure identification of fuzzzy model. 4. Comparative anaysis of conventional fuzzy controller with clustering based fuzzy controller. 5. Design of controllers for the speed control of dc motor. 6. Controller design for load frequency control of power system. 7. Conclusions and suggestions for further work. References and Appendixes.