

# FM01

## Poster Session

09:00-11:00

Room : base 2nd Floor-Zillertal

Chair1 : Hie sik Kim ( Univ. of Seoul, Korea )

Chair2 : Tae-Kyu Kwon ( Chonbuk Nat'l Univ., Korea )

FM01-43

### A Hybrid Modeling Architecture; Self-organizing Neuro-fuzzy Networks

Byoungjun Park, Sungkwun Oh(Wonkwang Univ., KOREA)

In this paper, we propose Self-organizing neurofuzzy networks(SONFN) and discuss their comprehensive design methodology. The proposed SONFN is generated from the mutually combined structure of both neurofuzzy networks (NFN) and polynomial neural networks(PNN) for model identification of complex and nonlinear systems. NFN contributes to the formation of the premise part of the SONFN. The consequence part of the SONFN is designed using PNN. The parameters of the membership functions, learning rates and momentum coefficients are adjusted with the use of genetic optimization. We discuss two kinds of SONFN architectures and propose a comprehensive learning algorithm. It is shown that this network ...

FM01-44

### Design of improved Multi-FNN for Nonlinear Process modeling

Hosung Park, Sungkwun Oh(Wonkwang Univ., KOREA)

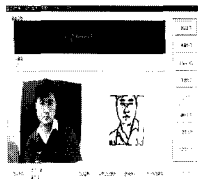
In this paper, the improved Multi-FNN (Fuzzy-Neural Networks) model is identified and optimized using HCM (Hard C-Means) clustering method and optimization algorithms. The proposed Multi-FNN is based on FNN and use simplified and linear inference as fuzzy inference method and error back propagation algorithm as learning rules. We use a HCM clustering and genetic algorithms (GAs) to identify both the structure and the parameters of a Multi-FNN model. Here, HCM clustering method, which is carried out for the process data preprocessing of system modeling, is utilized to determine the structure of Multi-FNN according to the divisions of input-output space using I/O process data. Also, the parame...

FM01-45

### Program Development of Emotional Human and Computer Interface

seul jung, Kiho Cho(Chungnam Nat'l Univ., KOREA)

- Human and computer interface(HCI)
- Voice recognition
- Image recognition
- Neural network
- Hopfield net



FM01-46

### Deadzone Compensation of Positioning Systems using Fuzzy Logic

Minkyong Son, Jun Oh Jang, Pyeong Gi Lee, Sang Bae Park, In Seok Ahn, Sung Hwan Lee(Uiduk Univ., KOREA)

**Abstract** A deadzone compensator is designed for a positioning system using fuzzy logic. The classification property of fuzzy logic systems makes them a natural candidate for the detection of errors induced by the deadzone, which has regions in which it behaves differently. A tuning algorithm is given for the fuzzy logic parameters, so that the deadzone compensation scheme becomes adaptive, guaranteeing small tracking errors and bounded parameter estimates. Formal nonlinear stability proofs are given to show that the tracking error is small. The fuzzy logic deadzone compensator is implemented on a positioning system to show its efficacy.

1. Deadzone Compensation
2. XY positioning table
3. Fuzzy Logic
4. Actuator nonlinearity

FM01-47

### Auto-Tuning Of Reference Model Based PID Controller Using Immune Algorithm

Dong Hwa Kim(Hanbat Nat'l Univ., KOREA)

**Abstract** – In this paper auto-tuning scheme of PID controller based on the reference model has been studied by immune algorithm for a process. Up to this time, many sophisticated tuning algorithms have been tried in order to improve the PID controller performance under such difficult conditions. However, in the actual plant, they are manually tuned through a trial and error procedure, and the derivative action is switched off. Therefore, it is difficult to tune. Simulation results by immune based tuning reveal that tuning approaches suggested in this paper is an effective approach to search for optimal or near optimal process control.

FM01-48

### Adaptive Image Enhancement Filter Design using FPGA and Handel-C

Jae Woo Wee, Seung Min Song, Min kyu Song, Je Gyo Jung, Seung Young Lee, Chong Ho Lee, Phill Kyu Lee(Inha Univ., KOREA)

- Introduction
- Background - Handel-C and Evolvable Hardware
- Filter Block
- Hardware Implementation
- Total System Overview
- Results
- Conclusion and Future Works