SA06

Intelligent Control II

10:10-12:10 **Chair1 : Dong Hwa Kim (Hanbat Univ., Korea)**
Room : 1st Floor-Brahms **Chair2 :**

10:10 – 10:30 **SA06-1**

An Interactive Approach based on Genetic Algorithm Using Hidden Population and Simplified Genotypes for Avatar Synthesis

Jayong Lee, Janghee Lee, Kang Hoon(Chungang Univ., KOREA)

In this paper, we propose an interactive genetic algorithm (IGA) to implement an automated 2D avatar synthesis. The IGA technique is capable of expressing user's personality in the avatar synthesis by using the user's response as a candidate for the fitness value. Our suggested IGA method is applied to creating avatars automatically. Unlike the previous works, we introduce the concepts of 'hidden population', as well as 'primitive avatar' and 'simplified genotype', which are used to overcome the shortcomings of IGA such as human fatigue or reliability, and reasonable rates of convergence with a less number of iterations. The procedure of designing avatar models consists of two steps. The fir...

10:30 – 10:50 **SA06-2**

Intelligent Control by Immune Network Algorithm Based Auto-Weight Function Tuning

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

Abstract – In this paper auto-tuning scheme of weight function in the neural networks has been suggested by immune algorithm for nonlinear process. A number of structures of the neural networks are considered as learning methods for control system. A general view is provided that they are the special cases of either the membership functions or the modification of network structure in the neural networks. On the other hand, since the immune network system possesses a self organizing and distributed memory, it is thus adaptive to its external environment and allows a PDP (parallel distributed processing) network to complete patterns against the environmental situation. Also. It can provi...

10:50 – 11:10 **SA06-3**

A Design of Adaptive Steering Controller of AGV using Immune Algorithm

Chang Hoon Lee, Jin Woo Lee(Donga Univ., KOREA), Kwon Soon Lee(Donga Univ., KOREA), Young Jin Lee(KAPC, KOREA)

1. Introduction
- Immune system is an evolutionary biological system to protect innumerable foreign materials such as virus, germ cell, and etc. Immune algorithm is the modeling of this system's response that has adaptation and reliableness when disturbance occur.
- In this paper, Immune algorithm is applied to the Steering Controller of AGV in container yard.
- And then the computer simulation result from the viewpoint of yaw rate and lateral displacement is analyzed and compared with result of conventional PID controller.

2. Dynamic Modeling of AGV
- Dynamic modeling has high degree of freedom. But, basic assumptions of this model are that the center of gravity(CG) ...

11:10 – 11:30 **SA06-4**

The Control of an Electrostrictive Polymer Actuator by Using Neural Network.

Ji Won Youn, Jae Wook Jeon, Jae Do Nam, Hyoukryeol Choi, Hunmo Kim(Sungkyunkwan Univ., KOREA)

- In order to operate EP actuator, high voltage is applied to that.
- Our previous control algorithm for an EP actuator was PI method with constant gain.
- But this control method is limitation such as rising time, steady-state error, and settling time.
- A neural network algorithm is proposed for improvement of performance.
- To do this, neural network algorithm changes the gain of PI control.
- In order to efficient drive EP actuator, the gain is changed at some point.
- Neural network method improve the performance of operation.

11:30 – 11:50 **SA06-5**

Design of State machine using Evolvable Hardware and Genetic Algorithm Processor

Tae Hoon Kim, Dong-Wook Lee, Kwee-Bo Sim(Chungang Univ., KOREA)

1. Introduction
2. Property of FPGA
3. Evolvable Hardware (EHW)
4. Genetic Algorithm Processor (GAP)
5. State Machine
6. Conclusion

11:50 – 12:10 **SA06-6**

Application of rule based expert system to GDS (Grating automatic Drawing System)

Su Hyoun Lee, Tae Ho Cho(Sungkyunkwan Univ., KOREA)

This paper presents an application of rule based expert system to GDS. Expert system is a computer-based system that uses knowledge, facts, and reasoning techniques to solve problems that normally require the abilities of human experts. Expert system can be classified as synthesis expert system, classification expert system or combination of these. The Expert system of GDS belongs to the synthesis type of expert system. GDS is a graphic design environment that automates complex and time consuming processes in the design phase of the grating production. There are methodical procedures in the design phase of gratings and each process needs the know-how of a skillful designer. User has to know...