I-TMP02 International Poster Session

14:00-14:50 **Chair : Park Sun Won (KAIST)**
Room : Terrace(3F) **Co-Chair : E-Sok Kang (Chungnam National Univ.)**

14:00 – 14:50 **I-TMP-16**

Closed-loop Feedback Control for Enhancing QoS in Real-time communication Networks

Hyung Seok Kim, Wook Hyun Kwon
(Seoul Univ.)

In this paper, control theoretic approaches are proposed to guarantee QoS (Quality of Service) such as packet delay and packet loss of real-time traffic in high-speed communication network. Characteristics of variable rate real-time traÆc in communication networks are described. The mathematical model describing networks including source and destination nodes are suggested. By a traffic control mechanism, it is shown that worst-case end-to-end transfer delay of traffic can be controlled and packet loss can be prevented. The simulation shows results of delay control and buer level control to raise QoS in real-time traffic.

14:00 – 14:50 **I-TMP-17**

Design of a Voting Mechanism considering Safety for Reliable System Using EPLD and Reliability Analysis

Ryoo. Dongwan., Lee Hyungjik, Lee Jeunwoo (ETRI)

The protection system of the system communication, nuclear reactor and chemical reactor are representative of reliable system. This reliable system must be designed based on reliability as well as concept of safety, which is a failed system go a way of safe. Reliable system is composed of part of data acquisition, calculator, communication with redundancy, and a voter is important factor of reliability. Because it is serially connected. This paper presents a Design and Analysis of a Voting Mechanism considering Safety for reliable system Using EPLD. In the case of digital implementation a coincidence logic (voter) of reliable system, it needs CPU and memory, so increase a number of units. Therefore the failure rate and cost are increased on contrary when it is designed EPLD or FPGA.

14:00 – 14:50 **I-TMP-18**

A Design and Implement of the Medical Nd:YAG Laser Firmware under in ZCC method

Whi-Young Kim
(DongJu College)

The pulsed Nd:YAG laser is the most commonly used type of solid-state laser in many fields. In material processing and medical treatment, the power density control of a laser beam considered to be significant, which depends on the flashlamp current pulse width and pulse repetition rate. For general laser power supply to control the laser power density, the secondary of the power transformer is connected to the rectifier and filter capacitor. The output of a rectifier is applied to a switching element in the secondary of the transformer. So power supply is complicated and the loss of switching is considerably. In addition, according to increasing pulse repetition rate, charged energy of energy-storage capacitor bank is not transferred sufficiently to flashlamp, and laser output efficiency decreases. In this study, we have ...

14:00 – 14:50 **I-TMP-19**

Robust Adaptive Controller for MIMO Nonsquare Nonlinear Systems Using Universal Function Approximators

Jang-Hyun Park, Ho-Joon Seo, Gwi-Tae Park (Korea Univ.)

This paper addresses the problem of designing robust adaptive output tracking control for a class of MIMO nonlinear systems which have different number of inputs and outputs. The stability of the whole closed-loop system is guaranteed in the sense of Lyapunov and uniformly ltimately boundedness of the tracking error vector as well as estimated parameters are shown. In addition, we show that the restrictive assumptions on input gain matrix which is presumed in the past works can be eliminated by using proposed control law.

14:00 – 14:50 **I-TMP-20**

Adaptive Parameter Estimator Design for Takagi-Sugeno Fuzzy Models

Chang-Woo Park, Chang-Hoon Lee, Mignon Park(Yonsei Univ.)
Seungho Kim(Korea Atomic Energy Research Institute)

In this paper, a new on-line parameter estimation methodology for the general continuous time Takagi-Sugeno(T-S) fuzzy model whose parameters are poorly known or uncertain is presented. An estimator with an appropriate adaptive law for updating the parameters is designed and analyzed based on the Lyapunov theory. The adaptive law is designed so that the estimation model follows the plant parameterized model. By the proposed estimator, the parameters of the T-S fuzzy model can be estimated by observing the behavior of the system and it can be a basis for the indirect adaptive fuzzy control.

14:00 – 14:50 **I-TMP-21**

Acquisition of Fuzzy Control Rules using Genetic Algorithm for a Ball & Beam System

S. B. Cho, K. H. Park, Y. W. Lee (Dongeui Univ.)

Fuzzy controls are widely used in industrial fields using experts knowledge base for its high degree of performance. Genetic Algorithm(GA) is one of the numerical method that has an advantage of optimization. In this paper, we present an acquisition method of fuzzy rules using genetic algorithm. Knowledge of the system is the key to generating the control rules. As these rules, a system can be more stable and it reaches the control goal the faster. To get the optimal fuzzy control rules and the membership functions, we use the GA instead of the experts knowledge base. Information of the system is coded the chromosome with suitable phenotype. Then, it is operated by genetic operator, and evaluated by evaluation function. Passing by the decoding process with the fittest chromosome, the genetic algorithm can tune the fuzzy rules and the membership functions automatically. ...