# I-TP03 Computer Control 1

**13:00-15:00** **Chair : T. Collier (UCLA)**
**Room : C202** **Co-Chair : Masahiko Itoh (Miyagi National College of Technology)**

**13:00 – 13:20** **I-TP03-1**

### Natural Language Interface to an Intrusion Detection System

K. Wee1(Ajou Univ.) T. Collier, G. Kobele, E. Stabler, C. Taylor(California Univ.)

Computer security is a very important issue these days. Computer viruses, worms, Trojan horses, and cracking are prevalent and causing serious damages. There are also many ways developed to defend against such attacks including cryptography and firewalls. However, it is not possible to guarantee complete security of computer systems or networks. Recently much attention has been directed to ways to detect intrusions and recover from damages. Although there have been a lot of research efforts to develop efficient intrusion detection systems, little has been done to facilitate the interaction between intrusion detection systems and users...

**13:20 – 13:40** **I-TP03-2**

### Plasma control Using a Linear Quadratic Regulated RF Impedance Match Process

Byung Whan Kim (Sejong Univ.),
Jang Hyun Park, Gwi Tae Park ( Korea Univ.)

A real-time control strategy is presented for plasma control. Rather than in-situ plasma variables, this is based on real-time measurements of two electrical positions that correspond to two match motors. Using the rf match monitor system, the positions were collected. The process of impedance matching was identified with variations in process factors, including rf power, pressure, and $O_2$ flow rate. A state-space model was obtained basing on autoregressive moving average model. For this model, a linear quadratic regulator was designed and applied. Simulation results revealed that match positions could accurately be regulated to follow certain positions arbitrarily chosen.

**13:40 – 14:00** **I-TP03-3**

### Realization of Nonlinear Driving Controller for Magnetic type AutomaticPipe-cutting Machine against Varying Gravity

Myung-Chul Lee , Soon-Geul Lee
(Kyunghee Univ.)

In this paper, an automatic pipe-cutting machine that uses magnet to attach itself to pipe and performs unmanned cutting process is proposed. The machine uses magnetic force to prevent slip and to attach the machine to the pipe against gravity. The magnetic force is adjustable by changing the gap between the magnet and the pipe. During pipe cutting process, the gravity acting on the pipe-cutting machine widely varies nonlinearly where the gravity is function of climbing angle of the cutting machine along the pipe. The cutting quality is deteriorated with irregular cutting speed. It is necessary to maintain constant cutting speed to obtain good cutting quality...

**14:00 – 14:20** **I-TP03-4**

### Vibration Suppression control for an Articulated Robot: Effects of Model-Based Control Applied to a Waist Axis

M. Itoh(Miyagi National College of Technology) and H. Yoshikawa(Sanyo Denki co., Ltd.)

This paper deals with a control technique of eliminating the transient vibration of a waist axis of an articulated robot. This technique is based on a model-based control in order to establish the damping effect on the mechanical part. The control model is composed of reduced-order electrical and mechanical parts. This model estimates a load speed converted to the motor shaft. The difference between the estimated load speed and the motor speed is calculated dynamically and is added to the velocity command to suppress the transient vibration of a waist axis of the arm. This control model is easily obtained from design or experimental data and can be easily integrated into a DSP. This control technique is applied to a waist axis of an articulated robot composed of a harmonic drive ...

**14:20 – 14:40** **I-TP03-5**

### Performance and Robustness of Discrete Perturbation Observer

SangJoo Kwon, Wan Kyun Chung, Youngil Youm
(POSTECH)

In conventional perturbation estimators such as disturbance observers(DOB) [1, 2] or time-delayed con- trollers(TDC) [3{5}, the low pass filter(so-called Q-filter) plays an important role in the stability and performance. However, a general design guideline or analysis for the Q-filter has not been researched yet. In this paper, a guideline for the design of discrete Q-filter is suggested in terms of the analysis of the relationship between the filter parameters and stability/performance robustness in discrete-time domain. The analysis clarifies the discrete-time effect of the per- turbation estimator and provides a transparent relationship between performance and robustness depending ...