

# D-SMP01

## Domestic Poster Session

13:00 – 13:50

Chair : Kim Soo Hyun (KAIST)

Room : Terrace(3F)

Co- Chair : Jooyoung Park (Korea Univ.)

13:00 – 13:50

D-SMP-1

### Development of train speed controller for EMU using servo-controller

Su-Gil Lee, Seong-Ho Han, Young Jae Han (KRRRI)

The ATO(Automatic Train Operation) System is used for train operation instead of drivers. It is interfaced with TCMS(Train Control and Monitoring System) and ATC/TWC system in the train and wayside facilities. In this paper describes configuration of ATO, Specification of ATO hardware, construction of ATO software and the algorithm for automatic train speed regulation in the carborn ATO system. This paper is mainly concerned with the development of the ATO System. The ATO system is used for automatic or driverless operation of a train using various informations from TCMS, ATC, TWC. In this paper, the general architecture of the ATO system, implementation of ATO application software and the algorithm using servo-controller for automatic train speed controller.

13:00 – 13:50

D-SMP-2

### Implementation of OSEK/VDX for Automotive Body Control System

Kim Kee-Woong, Kim Tae-Yol, Kim Jae-Goo, Lim Hong-Joon, Ryu Syeh-Yung, Lee Suk (Pusan National Univ.)

Today, many electronic devices and ECUs (Electronic Control Units) are used in the automotive body control systems. It becomes more common that these devices exchange data with others through an in-vehicle network. Automobile manufacturers concentrate their efforts on development of body control systems based on networks in order to save cost and to increase flexibility and safety. OSEK/VDX has been founded as a joint project in German and French automotive industry aiming at an industry standard for an open-ended architecture for distributed control units in vehicles. OSEK/VDX consists of Communication (specification of data exchange within and between control units), Network Management (specification of Configuration determination and monitoring) and Operating System (specification of real-time executive for ECU software ...

13:00 – 13:50

D-SMP-3

### Cooperative Coordination Method of Neural Network Controller Module for Autonomous Mobile Robot Navigation

Han Seong-Joo, Oh Se-Young (POSTECH)

This paper is concerned with designing a neural network based navigator that is optimized in a user-defined sense for a mobile robot using ultrasonic sensors to travel to a goal position safely and efficiently without any prior map of the environment. The neural network has a dynamically reconfigurable structure that not only can optimize the weights but also the input sensory connectivity in order to meet any user-defined objective. Therefore, in this research, we can select an optimal subset of sensory inputs that results in the best performance related to both navigation and structural complexity. Further, this research uses the manually trained initial population and the modular neural network to alleviate ...

13:00 – 13:50

D-SMP-4

### Self-Tuning Gain-Scheduled Skyhook Control for Semi-Active Suspension System: Implementation and Experiment

Hong Kyung-Tae, Sohn Hyun-Chul, Jung Jae-Ryong, Hong Keum Shik (Pusan National Univ.)

In this paper a self-tuning gain-scheduled skyhook control for semi-active suspension systems is investigated. The dynamic characteristics of a continuously variable damper including electro-hydraulic pressure control valves is analyzed. A 2-d.o.f. time-varying quarter-car model that permits variations in sprung mass and suspension spring coefficient is considered. The self-tuning skyhook control algorithm proposed in this paper requires only the measurement of body acceleration. The absolute velocity of the sprung mass and the relative velocity of the suspension deflection are estimated by using integral filters. The skyhook gains are gain-scheduled in such a way that the body acceleration and the dynamic tire force are optimized. An ECU prototype ...

13:00 – 13:50

D-SMP-5

### Emotion - Based Intelligent Model

Sung-Bum Ko(Chonan Univ.) and Gi-Young Lim(Hanbat Univ.)

We, Human beings, use both powers of reason and emotion simultaneously, which surely help us to obtain flexible adaptability against the dynamic environment. We assert that this principle can be applied into the general system. That is, it would be possible to improve the adaptability by covering a digital oriented information processing system with an analog oriented emotion layer. In this paper, we proposed a vertical slicing model with an emotion layer in it. And we showed that the emotion-based control allows us to improve the adaptability of a system at least under some conditions.

13:00 – 13:50

D-SMP-6

### Silicon-micromachined Microneedle for Suction and Injection of Bio Samples

Paik Seung-Joon, Kim Jong-Pal, Kim Se-Tae, Park Sang-Jun, Chung Seok, Chang Jun-Keum, Chun Kuk-Jin, Cho Dong-il (Seoul National Univ.)

Silicon-micromachined microneedle for a biofluid diagnosis system is developed. To fabricate microneedles, two sets of processes are used. One is making buried microchannels in silicon wafer using silicon isotropic etch with a SF6 plasma and then trench-refilling. The other is releasing the body of the microneedle by deep silicon etch. The microneedle has a 4 mm-length and about 12  $\mu\text{m}$ -diameter buried microchannel, a 1.5 mm $\times$ 1.5 mm-area reservoir, and about 180  $\mu\text{m}$ -thickness body. Preliminary results indicate that microneedles are capable of flowing fluidic samples. The microneedle with a buried microchannel is expected to be integrated with in vitro diagnosis systems and microfluidic devices.