I-TA03 Computer Vision-Motion Control

08:30-10:30 **Chair : Sano Masaki (Univ. of Tokyo)**
Room : C202 **Co-Chair : Jung SI (Chungnam National Univ.)**

08:30 – 08:50 **I-TA03-1**

On Enhancing of Inner Loop Regulators for Remote Control in Robotic Systems

Issara Issarangkoon, Warinda Natasiri, Pitikhate Sooraksa, and Prakit Tangtisanon
(King Mongkut's Institute of Technology Ladkrabang)

This paper present the idea that the inner loop regulator inside the servo can be enhanced its performance by replace the conventional control with a fuzzy proportional-derivative control. In this paper, we replace an inner loop regulator of a Futaba servomotor with a fuzzy PD control paradigm. We then test the proposed system and compare the result with the original scheme. The fuzzy control used here is based on the supervisory scheme of the conventional PD yet embedded a fuzzy decision for the final control action. The proposed control scheme for the servomotor has shown robustness and effective performance in handle input disturbance along with its tracking ability. Moreover, when we embedded the new implemented on a real six-legged insect robot designed by the authors, we found that the control system for this application under the ...

08:50 – 09:10 **I-TA03-2**

DYNAMIC ROUTE PLANNING BY Q-LEARNING -Cellular Automation Based Simulator and Control

Masami Hikawa, Hideji fujikawa, Koichiro Shida and Ben T. Nohara
(Virginia Polytechnic Institute and State Univ.)

In this paper, the authors present a new dynamic route planning by Q-learning. The proposed algorithm is executed in a cellular automation based traffic simulator, which is also newly created. In Vehicle Information and Communication System(VICS), which is an active field of Intelligent Transport System(ITS), information of traffic congestion is sent to each vehicle at real time. However, a centralized navigation system is not realistic to guide millions of vehicles in a megalopolis. Autonomous distributed systems should be more flexible and scalable, and also have a chance to focus on each vehicle's demand. In such systems, each vehicle can search an own optimal route. We employ Q-learning of the reinforcement learning method to search an optimal or sub-optimal route, in which route drivers can avoid traffic congestions. We find some applications of the reinforcement learning in the "static" environment, but there are ...

09:10 – 09:30 **I-TA03-3**

Tracking Object of Snake based on the Refinement using 5 Point Invariant

Won Kim and Ju-Jang Lee

(KAIST)

In cases where strong a priori knowledge about the object being analyzed is available, it can be embedded into the formulation of the snake model. When prior knowledge of shape is available for a specific application, information concerning the shape of the desired objects can be incorporated into the formulation of the snake model as an active contour model. In this paper we show Five points algorithm can be applied to design invariant energy.

09:30 – 09:50 **I-TA03-4**

Collective Motion of Interacting Simple Robot System

Ken Sugawara, Masaki Sano, Toshinori Watanabe
(Univ. of Electro-Communications)

Many livings form groups which we consider as collective systems. The collective motion of the group shows various dynamics and patterns, and many model equations are proposed to explain such phenomenon. In our previous work, we proposed simple deterministic model which shows various types of group behaviors. In this paper, we modify it in order to apply to a real robotic system. Here we assume that the space resolution of each robot's sensors is low and that the sensors detect the nearest robots. It was confirmed the robots with modified model also shows various types of motion.