FA05

Robot System II

09:00-11:00
Room : 1st Floor-Strauss

Chair1 : Masanao Obayashi (Yamaguchi Univ., Japan)
Chair2 : Myoung H. Choi (Kangwon Nat'l Univ., Korea)

09:00 – 09:20 **FA05-1**

Performance Evaluation of An Intuitive Robot Teach Method Using a Force/moment Direction Sensor

Myoung H. Choi, Woo Won Lee(Kangwon Nat'l Univ., KOREA)

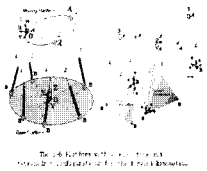
- A quantitative performance evaluation of an intuitive robot teach method is presented.
- Teach times for two types of teach tasks are compared to the conventional teach pendant method.
- Teach tasks requiring a 4 DOF motion and a 6 DOF motion were tested.
- Compared to the teach pendant method, the proposed method reduce the teach times to 75% and 55%.
- The intuitive teach method is easier for the untrained robot users.

09:20 – 09:40 **FA05-2**

Determination of the Actual Solution of the Forward Kinematics of 6-dof Parallel Manipulators

Se-Kyong Song(Samsung Electronics Co. Ltd., KOREA), J.Y. Choi, H.K. Sung(Samsung Electronics Co. Ltd., KOREA), Dong-Soo Kwon(Dept. Mechanical Engineering, KAIST)

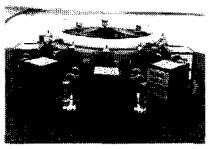
- Presents a new method to determine the actual solution of the forward kinematics based on the geometry of the 3-6 Platform with a 3-2-1 type.
- The method is simple and effective to determine the actual solution.



09:40 – 10:00 **FA05-3**

Five-DOF Polymer Actuator Based on Dielectric Elastomer

Kwangmok Jung, Sangwon Lee, Jongwon Kwak, Hunmo Kim, Jaedo Nam, Jaewook Jeon, Hyoukryeol Choi (Sungkyunkwan Univ. KOREA)



In this paper, we present a five-DOF actuator based on dielectric elastomer. The actuator is designed for generating five DOFs motions to drive a micro camera steering module and provides all the functions for controlling CCD array such as focusing, pan and tilting. Basic modeling of the actuator is performed, and simulation works and experimental verifications are conducted, too. The camera steering module includes most parts necessary for driving the actuator such as a micro-controller and DC-DC converter, etc. It can be operated with a personal computer using only communication lines without external power supply. A prototype is developed and its performance is experimentally proved.

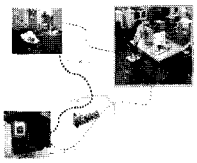
- artificial muscle, EAP, actuator

10:00 – 10:20 **FA05-4**

Internet-Based Control for Distributed Robotic Systems Using CORBA as Communication Architecture

Songmin Jia, Yoshiro Hada, Gang Ye, Chunhai Hou, Kunikatsu Takase(Univ. of Electro Communications., JAPAN)

- Introduction
- System hardware base
- System software implementation
- Connect robotic systems to Internet
- Conclusions



10:20 – 10:40 **FA05-5**

Evolutionary Reinforcement Learning System with Time-Varying Parameters

Kosuke Umesako, Masanao Obayashi, Kunikazu Kobayashi(Yamaguchi Univ., JAPAN)

We propose an evolutionary reinforcement learning (RL) system with time-varying parameters that can deal with a dynamic environment. The proposed system has three characteristics: 1) It can deal easily with a dynamic environment by using time-varying parameters; 2) The division of state space is acquired evolutionarily by genetic algorithm (GA); 3) One does not have to design the rules constructing an agent in advance. So far many RL systems have been proposed. These systems adjust constant or non time-varying parameters; by those systems it is difficult to realize appropriate behavior in complex and dynamic environment. Hence, we propose the RL system whose parameters can vary temporally. T...

10:40 – 11:00 **FA05-6**

Anthropomorphic Robot Hand: Gifu Hand III

Tetsuya Mouri, Haruhisa Kawasaki, Keisuke Yoshikawa, Jun Takai, Satoshi Ito(Gifu Univ., JAPAN)

- The Gifu Hand III is a 5-fingered hand driven by built-in servomotors and has 20 joints with 16 DOF.
- The backlash of transmission, the mobility space, and the opposability of the thumb are improved.
- The new distributed tactile sensor with 859 detecting points is mounted on the hand surface.
- Experiments of grasping objects by a grasping strategy imitating human grasping reflex are shown.