I-FA01 Internet-Based Control

09:00-11:00 **Chair : Choi Gi Sang (Seoul Univ.)**
Room : C105 **Co-Chair : Sumalee Unhavanich (King Mongkut Institute of Technology)**

09:00 – 09:20 **I-FA01-1**

Internet Teleoperation of a Robot with Streaming Buffer System under Varying Time Delays

J.-H. Park and J. Kwon
(Hanyang Univ.)

It is known that existence of irregular transmission time delay is a major bottleneck for application of advanced robot control schemes to internet telerobotic systems. In the internet teleoperation system, the irregular transmission time delay causes a critical problem, which is unstable and inaccurate. This paper suggests a practical internet teleoperation system with streaming buffer system, which consists of a buffer, a buffer manager, and a control timer. The proposed system converts the irregular transmission time delay to constant. So, the system effectively transmits the control input to a remote site to operate a robot stably and accurately. This feature enables short control input interval. That means the entire system has...

09:20 – 09:40 **I-FA01-2**

Design and Implementation of Internet-based Teleopeartion Control System

Jin-Woo Park, and Jang-Myung Lee (Pusan Univ.)

In this paper, when we design and implement an internet-based teleoperation control, some important points that should be considered (e.g., transmission characteristics, time delay prediction and transmission protocol) are inspected and simulated. First, we will investigate data transmission characteristics at the Internet, and build a model for the transmission delay and packet loss through the characteristics of that effect. And then, we inspect how to predict transmission delay, and examine transmission protocols which are proper for the control-oriented Internet protocol. Finally, we apply it to a force-reflective teleoperation control system that consists of a six d.o.f haptic interface and a five d.o.f manipulator via the Internet.

09:40 – 10:00 **I-FA01-3**

Microcontroller-Based Liquid Level Control Modeling

Teerasilapa DUMAWIPATA , Sumalee UNHAVANICH, and
Worapong TANGSRIRAT
King Mongkut's Institute of Technology North-Bangkok (KMITNB)

This work presents a design technique for the implementation of the liquid level control system by based on the use of a single-chip microcontroller. The proposed model system offers the following attractive features : (1) application of the pressure transducer for sensing the height of liquid in tank (2) using the obtained liquid level for defining on-off condition of the water pump (3) the liquid values were controlled by using stepping motors for controlling of 57 points (4) can set up by using manual control or automatic control (5) can monitor and display the process status either on microcontroller-based control board or on the computer via RS232 serial-port. Experimental results have been employed to show the effectiveness...

10:00 – 10:20 **I-FA01-4**

Web-based Distribute Control Networks

Kiwon Song, Jonghwi Kim, Gi Sang Choi (Univ. of Seoul)
and Gi Heung Choi (Hansung Univ.)

Requirements for device control networks differ greatly from those of data (business) networks. Consequently, any control network which uses a filedbus protocol is, in general, different from IP network protocol TCP/IP. One then needs to integrate both fieldbus protocol and TCP/IP to realize distributed control over IP network or internet. LonWorks technology provides networked intelligent I/O and controllers which make it a powerful, expandable solution. Connecting these remote Lon Works networks to the Internet can provide a powerful, integrated, distributed control system. This paper suggests a basic concept that be applied to distributed control over IP network or internet. Specially, LonWorks technology that used LonTalk protocol is reviewed as device network and ...

10:20 – 10:40 **I-FA01-5**

IP-based UPnP Control of Network-enabled IEEE 1394 Devices

Soo-Kyung Yang and Jong-An Park
(Chosun Univ.)

There are lots of wired and wireless home network technologies these days. However, an effective middleware is needed to control devices in home regardless oj any kinds of home network technologies applied. We can integrally and simply control all the home appliances using the architecture that leverages TCP/IP and Web technologies, which is like UPnP control technology. In this paper, UPnP technology and IEEE 1394 technology are introduced., and also UPnP over 1394 is issued. Some results from the implementation show that it is possible to control IEEE 1394 devices using the IP-based UPnP technology instead of just using a direct AV/C command set. So, in the experiment, implements the modeling of the UPnP-enabled IEEE 1394 device which is not present for real. Therefore, promising ...

10:40 – 11:00 **I-FA01-6**

Precision Control X-Y Table Using Dual Modulus Technique

V. Tipsuwanporn, C. Mitravakin, P. Ukakimaparn, S. Kulpanich and
V. Konfratana (King Mongkut's Institute of Technology Ladkrabang)

This paper presents the control X-Y table being the precise movement by point-to-point in the x-y plane. The dual modulus technique is used for our system to control the frequency of pulse supplied to the motors. Such technique is used to stop motor of both axes accurately as the desired target point in the same period. Both motors are stepping motor. To improve steps per revolution, we employ ministep form to drive motors. In system, personal computer, using parallel port, is used for computing algorithm in open-loop form to control motors. In experiment, our system applies on the X-Y table for drawing to test system performance.