SA04

Manufacturing II

10:10-12:10 **Chair1 : Gi Sang Choi (Univ. of Seoul, Korea)**
Room : 1st Floor-Wilder Kaiser **Chair2 :**

10:10 – 10:30 **SA04-1**

Distributed Control with Varying Time Delay in Virtual Device Network

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

Recent trends in internet access to the device network require that information be provided from anywhere in the enterprise. One then needs to integrate both device network protocol and data network protocol to realize Virtual Device Network (VDN). Interoperability between devices and equipments is essential to enhance the quality and the performance of VDN. LonWorks technology is incorporated as device network protocol for interoperability. VDN integrating both device network and data network has varying time delay. Inherent varying time delay of VDN can significantly degrade the reliability of Distributed Control System. This study investigates the transmission characteristics of VDN and s...

10:30 – 10:50 **SA04-2**

Position Control of Linear Actuator with Uncertain Time Delay in VDN

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

Uncertain time delay happens when the process reads the sensor data and sends the control input to the plant located at a remote site in distributed control system. As in the case of data network using TCP/IP, VDN that integrates both device network and data network has uncertain time delay. Uncertain time delay can cause degradation in stability of distributed control system based on VDN. This paper investigates the transmission characteristic of VDN and suggests a control scheme based on the Smith's predictor to minimize the effect of uncertain time delay. The validity of the proposed control scheme is demonstrated with tracking position control of experiments.

10:50 – 11:10 **SA04-3**

Development of a Real-Time Error Detection System for an Electronic Jacquard

Jae-Yeong Huh, Chang-Jun Seo(Inje Univ., KOREA)

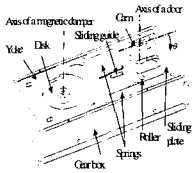
- Introduction
- The Structure and Operation of an Electronic Jacquard
- Design of Real-Time Error Detection System
- The System Realization and Verification
- Conclusion

11:10 – 11:30 **SA04-4**

Development of an Eddy Current Type Magnetic Floor Hinge

Kapjin Lee, Chulsoo Kim, Kyihwan Park(KJIST, KOREA)

- Magnetic floor hinge
- Recovering torque
- Eddy currents
- Magnetic damper
- Optimal design
- Cost optimization



11:30 – 11:50 **SA04-5**

Design of Robot Direct-Teaching Tool and its Application to Path Generation for Die Induction Hardening

Jae-Hyung Ahn, Sungchul Kang, Changhyun Cho(KIST, KOREA), Jisun Hwang, Mansuk Suh(HMC, KOREA)

To apply induction hardening method to a press die having 3-D free surface, the induction hardening tool moves on a press die above 1~2mm gap with constant velocity. Since the induction hardening process requires its own hardening path for each die, a direct teaching method which generates working path directly guided by operators is more suitable than an offline method using CAD/CAM data. The direct teaching apparatus in this work includes a teaching tool with a force/torque sensor and data processing computer to finally generate robot's induction hardening program. In direct teaching operation, an operator teaches working path maintaining contact with surface of press die by holding ...