

# D-SA02

## Process Control and Automation 3

09:00-11:00

Chair : Park Jin Bae ( Yonsei Univ. )

Room : 4128

Co-Chair : Han Chang Soo ( Hanyang Univ. )

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09:00 – 09:20

D-SA02-1

### Model Identification of Hydraulic Pin-On-Disk type Tribotester with DDV

Kim Seung Hyun, Lee Chang Don and Lee Jin Kul  
(Pusan National Univ.)

This paper developed the model for electro hydraulic force control system by identification method via ARMAX model. Implementation of Identification is performed on Pin-On-Disk type tribotester. The wear mechanism is an important mechanic property to select a material's life and a optimum work condition. Pin-on-disk type tribotester is popular wear analysis experimental equipment and its mechanism is that adding a force on a rotating disk to simplify two surface contact's wear experimental condition. Material's rotating velocity and eccentricity rotation makes disturbance and it affects adding constant force. To get a high performance of force adding part, DDV(Direct Drive Valve) which has pressure control loop is used . To obtain a tribotester's ARMAX model, prediction error method(PEM) is used in case force adding part and rotating part is ...

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09:40 – 10:00

D-SA02-3

### A Study of Slip Ratio Control of 3 Port – 2 Position Solenoid Valve using PWM Control

Kim Jung-Hwan, Choi Jong-Hwan and Lee Jin-Kul  
(Pusan National Univ.)

Antilock brake system(ABS) prevent the wheels of road vehicle from locking up and skidding so that the braking force is from static friction instead of kinetic friction. Therefore ABS helps drivers maintain steering control during breaking situation particularly at an emergency stopping situation. So when trying to stop the road vehicle it is best to have the most friction possible for faster deceleration. ABS keep the wheels turning which means there is more friction between the tires of vehicles and the road surface. Because of this advantage, ABS are now a commonly installed feature for passenger's safety in road vehicles. In this study, hydraulic system of ABS of vehicle is composed of 3port-2position solenoid valve. In order to minimize ...

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10:20 – 10:40

D-SA02-5

### Development of Internet-based Collaborative Design System

Baek Dong Seok (Cubic Tech), Han Young-Geun (Myungji Univ.),  
Kim Gibom(SNUT), Kong Sang Hoon and Lee Kyo Il  
(Automatic Control Research Center - SNU)

As close competitions are being fought out among enterprises, they should accomplish their objectives such as reduction of cost, improvement of quality and condensation of due date, etc. For this objects, it becomes very important to manage the workflow harmoniously and to share the information efficiently between geographically dispersed users. We developed the collaborative design system, which manages various design process and enables to share design information. In this paper,Internet-based collaboration system for press die design process in the automobile manufacturer is developed with CORBA, Java and relational database system. After modeling real press die design process with UML language, workflow routing path is created by modeling data. Cost and time for ...

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09:20 – 09:40

D-SA02-2

### 3 Dimensional Modeling and Sensitivity Analysis for Vibration Reduction of the Spin-Coater System

Ryu Incheol, Chae Hochol, Han Changsoo(Hanyang University) and Jang Jinhee(Daewoo Motors)

In this paper, the dynamic system modeling and the state sensitivity analysis of the spin-coater system for the reduction of the vibration are proposed. In the respect of modeling, the spin-coater system is composed of components of servomotor, belt, spindle, and a supported base. Each component is defined and combined modeling is derived to 3 dimensional equations. Verification of modeling is verified by experimental values of actual system in the frequency domain. By direct differentiation the constraint equations with respect to kinematic design variables, such as eccentricity of spindle, moment of inertia, torsional stiffness and damping of supported base, sensitivity equations are derived to the verified state equations. Sensitivity of design variables could be used for vibration reduction and natural frequency shift in the frequency domain. Finally, dominant design variables ...

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10:00 – 10:20

D-SA02-4

### Design of Satellite System for the Back-up System of Unmanned Control Plant

Kee-Heon Chung, Young-Hwan Yoon, Doo-Gyoon Byun  
(Korea Water Resoures Corporation)

Safety and confidence of the communications network is the main purpose for the unmanned control systems, in terms of applying a satellite communications network to the water treatment and supply plant communication system. Since the unmanned control systems were applied in the industrial site, the lack of confidence on the communications network has been presented continuously as a main problem for the unmanned and automation systems. Therefore, satellite communications network was presented as one of the methods to solve this problem, supporting the wire used telecommunication. In addition to the safety of a communications network, there is the retrenchment of expenditure. This dual communications network has ...

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