D-TMP01 Domestic Poster Session

13:00 – 13:50   D-TMP-19

Position Control of Linear Actuator with Time Delay Using the Smith Predictor

Seung-Won Kang, Gi-sang Choi
(UOS Univ.)

This paper discusses tracking position control of linear actuator that has a time delay. The 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. In this thesis, the time delay between the linear actuator and the discrete PID controller has constant value due to buffer device so the time delay can be modeled by Pade approximation but the large position error of the linear actuator is generated by the time delay. Therefore, the Smith predictor is used for tracking position control of the linear actuator with the time delay in order to minimize the effect of the time delay. The experimental and simulation results show that the ...

13:00 – 13:50   D-TMP-20

A Design of Nonlinear Time-varying Fuzzy PID Controller for Position Control System using Embeded-sensor-type Hydraulic Cylinder

Jang-Ho Park, Jin-Gyu Kim, Gi-Seok Ryu, Byung-Geul Lee, Jong-Hwa Kim
(Korea Maritime Univ.)

A position control system using hydraulic cylinder is modeled as a nonlinear system. In order to control this nonlinear system, in this paper, the fuzzy PID control technique which has time-varying control parameters is adopted. In this study, an exclusive sensor to detect the position of hydraulic cylinder is used, which is embeded in hydraulic cylinder.

13:00 – 13:50   D-TMP-21

Eigenstructure Assignment for a Looper Control System

Lee Dong Wook , Ahn Byoung Joon , Park Sung Han , Lee Man Hyung
(Pusan National Univ.)

We describe the looper controller design for a hot strip mill. The looper is to control the strip tension which influences on the width of the strip. It is very important to control the looper control of the hot strip mill, but difficult to control the looper, because there exists mutual interaction among strip gauge, looper angle, and strip tension. In this paper, we present the modeling for the looper of a hot strip mill to control the tension of the strip and suggest a eigenstructure assignment method. The eigenstructure assignment is useful tool that allows the designer to satisfy damping, settling time, and mode decoupling specifications directly by choosing eigenvalue and eigenvectors. Desired eigenvalue and eigenvector are chosen to satisfy the desired responses.

13:00 – 13:50   D-TMP-22

Implementation of Motion Controller Using Network

Kim Min Kyu , Kim Hyun Suk , Yoo Ho Sun , Oh Hak Seo , Sung Hak Kyung
(Samsung Electronics Co. Ltd.)

In the area of factory automation (FA), a lot of researches are being executed about intelligent system using network. Conventional industry controllers are implemented the connection with other controllers by using asynchronous serial communications. These methods of communication have an advantage of easy implementation but have disadvantages of lack of real-time characteristics needed in motion control, slow baud rate too low to exchange required data sufficiently and low integrity because of different communication protocol. Serial real-time communication system (SERCOS) provides international standard communication specifications (IEC 61491) for interfacing between control units and drives from different manufacturers, has real-time ...

13:00 – 13:50   D-TMP-23

Decentralized Controller Design for Nonlinear Systems using LPV technique

Sangmoon Lee, Sungjin Kim, Sangchul Won
(POSTECH)

This paper investigates the problem of linear parameter-dependent output feedback controllers design for interconnected linear parameter-varying(LPV) plant. By using a parameter-independent common Lyapunov function, sucient conditions for solving the problems are established, which allow us to design linear parameter dependent decentralized controllers in terms of scaled H-infinite control problems for related linear systems without interconnections. The solvability conditions are expressed in terms of finite-dimensional linear matrix inequalities(LMI's) evaluated at the extreme points of the admissible parameter set.

13:00 – 13:50   D-TMP-24

The Design of Width Controller by using Looper Tension Control of Finishing Mill in Hot Strip Mill

Kyunghwan Kwon, Sangchul Won
(POSTECH)

There is a looper for the safety threading between stands in finishing mill. In this looper system, it is 2 inputs 2 outputs MIMO (Multi Input Multi Output) system, which has two inputs that are the angle of looper and the tension of Strip and has two outputs that are the torque of looper motor and the speed of Mill Motor. In tension controller of looper, it calculates the range of tension variation into the compensation value of speed and outputs to the speed controller of Mill Motor, so that it controls the tension of strip between stands. In this study, using this tension controller of looper, we adjust the establishment value of ......