D-FP03

Computer Control

13:00 – 13:20   **D-FP03-1**

Adaptive Nonlinear RED Algorithm for TCP Congestion Control

Park Kyung-Joon, Park Eun-Chan, Lim Hyuk and Cho Chong-Ho
(Seoul National University)

Congestion control is a critical issue in TCP networks, Recently, active queue management (AQM) was proposed for congestion control at routers. The random early detection (RED) algorithm is widely known in the AQM algorithms, We present an adaptive nonlinear RED (NRED) algorithm, which has nonlinear drop probability profile. The proposed algorithm enhanced the performance of the RED algorithm by the self-parameterization based on the traffic load. Furthermore, the proposed algorithm can effectively adapt itself between he RED and the drop-tail queue management by adopting proper nonlinearity in the drop probability profile. Through simulation, we show the effectiveness of the proposed algorithm comparing with the drop-tail and the original RED algorithm.

13:20 – 13:40   **D-FP03-2**

A Study on the Tip Position Control of Flexible Beam by Linear Matrix Inequality

Kim Chang Hwa(Kyungnam College of Information & Technology),
Chu Man Suk(Dongseo Univ.)
and Yang Joo Ho(Pukyong National Univ.)

Many of today's robot are required to perform tasks which demand a high level of accuracy in end-effector positioning. Those rigid robots are very inefficient and slow because its have large and heavy links, In an attempt to solve these problems, a robots using flexible beam were created. But the single-link flexible beam is infinite-dmensional system. Many researchers have proposed controlling such a beam an approximated model consisting of a finite a number of models. In this paper, we start by deriving the analytic model for the dynamics of general single-link beam, and a controller is designed for flexible beam with integral type servo system bases of the linear matrix inequality (LM) technique. To the end, simulation results show that a designed controller guarantees affective vibration control the single-link flexible beam.

13:40 – 14:00   **D-FP03-3**

Design of Multi-mode Tracking Algoritm for DBS Receiving Antenna on Shipboard

Choi Choel, Kim Youngho and Lee Sungjin
(Pusan National University)

The movement of a ship is important for DBS(Direct Broadcasting Satellite) Receiving Antenna control algorithm design on shipboard. Especially, turning of ship is essential factor to affect the angle change of azimuth and elevation. Therefore, to track the satellite stably, we need the tracking method considering turning rate of ship. In this paper, we propose an effective satellite tracking algorithm for DBS receiving antenna on shipboard. In the proposed method, when a ship is turned, it selects one of the Multi tracking modes - Normal mode, Low speed mode, Middle speed mode and High speed mode - according as turning rate to be calculated by using Gyro sensor.

14:00 – 14:20   **D-FP03-4**

A Study on Roll Eccentricity Detection in Hot Strip Mill

Choi Il Seop, Choi Seung Gap, Jeon Jong Hag, Hong Seong Cheol and Park Cheol Jae
(POSCO)

We propose an off-line methodology for detecting a faulty backup roll that generates eccentricity components, under the condition that the feeding velocity, equivalently the angular velocity of roll, is not constant. From a newly devised speed-angle conversion algorithm, we transform all process data into those of a virtual process under a constant feeding speed. This indirectly way, we can apply a spectral analysis to the original process. In addition, we develop an on-line detection method of roll eccentricity based on newly designed PLG sensor. This PLG sensor is robust because of applying magnetic proximity sensnors and non-contact measurement method

---

14:20 – 14:40   **D-FP03-5**

The Development of Coating Weight Model and Control Logics in Continuous Galvanizing Line

Chae Hong kook and Shin Ki Tae
(RIST)

For the last decade, remarkable progress in the coating weight uniformity of hot dip galvanized product has been made to overcome the tightening quality constraints and produce cost-effective galvanized products. This progress results from research and development works for more efficient air knife, more accurate model of coating process, more precise measurement of coating weight and more efficient control logics. The activities for an efficient mathematical model to predict coating weight and several control logics which has been implemented on the No.1 CGL, No. 2 CGL, and PGL at KwangYang Steel Works are reviewed in this article.

14:40 – 15:00   **D-FP03-6**

A Study of Robust Vibration Control System for Multi-layer Structure with Modeling Errors

Kim Young Wan, Lee Ki Dong, Yang Joo Ho
(Pukyong National University)
and Kim Chang Hwa(Kyungnam College of Information & Technology)

This paper introduce basic study how to restrain the vibration of multi-layer structure. We have modeled mathematically for four-layer-structure and have gotten a reduced nominal model through model analyzing method. And the H∞control theory was used in this control system to get robust controller. Its shown that the desirable performance is confirmed through the mathematical simulation and the experiments. That is the robustness of this control system which use H∞control theory is confirmed for ability of disturbance rejection and modeling error.