

# I-FMP02

## International Poster Session

14:00-14:50

Chair : Lee Man Hyung (Pusan National Univ.)

Room : Terrace(3F)

Co-Chair : Suh Il Hong (Hanyang Univ.)

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14:00 – 14:50

I-FMP-22

### Nonlinear PLS Monitoring Applied to An Wastewater Treatment Process

Yoon Ho Bang, Chang Kyoo Yoo, Sang Wook Choi and In-Beum Lee (POSTECH)

In this work, extensions to partial least squares (PLS) for wastewater treatment (WWT) process monitoring are discussed. Conventional data gathered by monitoring WWT systems are usually time varying, high dimensional, correlated and nonlinear. PLS has been shown to be an efficient approach in modeling and monitoring high dimensional and correlated data. To represent dynamic and nonlinear features of the data several kinds of dynamic nonlinear PLS (DNLPLS) models have been proposed. However, the complexity and ambiguity of the models make them unsuitable for WWT monitoring. Recently, dynamic fuzzy PLS (DFPLS) was proposed...

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14:00 – 14:50

I-FMP-24

### An Effective Face Region Detection Using Fuzzy-Neural Network

Chul-Min Kim, Sung-Oh Lee, Byoung-ju Lee, and Gwi-tae Park (Korea Univ.)

In this paper, we propose a novel method that can detect face region effectively with fuzzy theory and neural network. We make fuzzy rules and membership functions to describe the face color. In this algorithm, we use a perceptually uniform color space to increase the accuracy and stableness of the nonlinear color information. We use this model to extract the face candidate, and then scan it with the pre-built sliding window by using a neural network-based pattern-matching method to find eye. A neural network examines small windows of face candidate, and decides whether each window contains eye. We can standardize the face candidate geometrically with detected eyes.

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14:00 – 14:50

I-FMP-23

### Variable Pulse Generation Technology of Pulse ND:YAG Laser Using Real Time Multi-Discharge

Whi-Young Kim (Dongju College)

In this study, a solid-state laser system adopting a new real time multi-discharge (RTMD) method in which three flashlamps are turned on consecutively was designed and fabricated to examine the pulse width and the pulse shape of the laser beams depending upon the changes in the lamp turn-on time. That is, this study shows a technology that makes it possible to make various pulse shapes by turning on three flashlamps consecutively on a real-time basis with the aid of a PIC one-chip microprocessor. With this technique, the lamp turn-on delay time can be varied more diversely from 0 to 10 ms and the real-time control is possible with an external keyboard, enabling various pulse shapes. In addition, longer pulses can be more widely used for industrial processing and lots of medical purposes.

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14:00 – 14:50

I-FMP-25

### Feature selection using genetic algorithm for constructing time-series modelling

Sang-Keon Oh, Sun-Gi Hong, Chang-Hyun Kim, and Ju-Jang Lee (KAIST)

An evolutionary structure optimization method for the Gaussian radial basis function (RBF) network is presented, for modelling and predicting nonlinear time series. Generalization performance is significantly improved with a much smaller network, compared with that of the usual clustering and least square learning method.

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