

# D-FMP01

## Domestic Poster Session

13:00-13:50

Chair : Huh Uk-Youl (Inha Univ.)

Room : Terrace(3F)

Co-Chair : Kim In Won (Konkuk Univ.)

13:00 – 13:50

D-FMP-01

### Model-based fault diagnosis methodology using neural network and its application

In-Soo Lee, Kwang-Tae Kim(Sangju Univ.) Won-Chul Cho(Kyongdo Univ.), Jung-Teak Kim(KAWRI) Kyung-Youn Kim, Yoon-Joon Lee(Cheju Univ.)

In this paper we propose an input/output model-based fault diagnosis method to detect and isolate single faults in the robot arm control system. The proposed algorithm is functionally composed of three main parts-parameter estimation, fault detection, and isolation. When a change in the system occurs, the errors between the system output and the estimated output cross a predetermined threshold, and once a fault in the system is detected, and in this zone the estimated parameters are transferred to the fault classifier by ART2(adaptive resonance theory 2) neural network for fault isolation. Since ART2 neural network is an unsupervised neural network fault classifier does not require the knowledge of all possible faults to isolate the faults occurred in the system. Simulations are carried out to evaluate the performance of the proposed.....

13:00 – 13:50

D-FMP-02

### The Fault Diagnosis of a Transformer Using Neural Network and Transfer Function

Byung-koo Park, Jong-wook Kim, Sang Woo Kim, Poo-Gyeon Park, Park Tae Joon (POTTECH)

A transformer is one of the most important elements in the power network. Transformer faults could cause costly repairs and be dangerous to personnel. To avoid this, its reliable operation has great significance and, therefore, the diagnosis system of the transformer is necessitated. The dissolved gas-in-oil analysis (DGA) is the worldwide popular method of detecting faults such as a hot spot or partial discharges inside the transformer. DGA, however, is not a reliable technique to identify aging phenomena and mechanical faults including insulation failure, inter-turn short, etc. To overcome the drawbacks of DGA, the transfer function method is used to identify effectively these kinds of the mechanical faults. The transformer has a unique transfer function independent of the shape of the input waveform, which can be evaluated through sweep test. This transfer function changes by winding ...

13:00 – 13:50

D-FMP-03

### Feedback Control of DC-DC Converters for Solar-Cell using DSP

Sung-Rae Cho, Jae Hyuk Kwak, Joon-Hong Lim (Hanyang Univ.)

In this paper, we present a technique of feedback control for different types of DC-DC converter using single DSP. To improve dynamic response due to the variation of input voltage and current from solar cell caused by weather condition, the system is modeled as a hybrid system and simulated by MATLAB. Simulation result and experimental system are also compared with analog feedback control system.

13:00 – 13:50

D-FMP-04

### Discontinuous Surface Profile measurement using Wavelength Scanning Interferometer(WSI)

Kang Chul Goo, Cho Hyoung Suck, Lee Jae Yong, Hahn Jae Won (Konkuk Univ.)

Inspection and shape measurement of three-dimensional objects are widely needed in industries for quality monitoring and control. A number of visual or optical technologies have been successfully applied to measure three dimensional surfaces. Especially, the shape measurement using an interferometric principle becomes a successful methodology. However, those conventional interferometric methods to measure surface profile have an inherent shortcoming, namely  $2\pi$  ambiguity problem. The problem inevitably happens when the object to be measured has discontinuous shape due to the repetition of interferometric signal with phase period of  $2\pi$ . Therefore, in this paper, we choose as a shape measuring method, .....

13:00 – 13:50

D-FMP-05

### Localization and Thickness Measurement of the Measuring Plane Using Ultrasonic Sensor and Encoder

Kim Hyung Kuk, Ahn Hee Tae, Lee Dong Hwal, Jeong Seung gwon, Bae Jong Il (Pusan National Univ.)

The 3-dimensional measuring machine by using an ultrasonic sensor is used one of the NDE (Nondestructive Evaluation). It is applied to the inspection of pipelines, boreholes, pressure vessel and tank, and so on. In particular when a harsh environment prohibits the use of moving mechanical parts. The 3-dimensional measuring machine by using an ultrasonic sensor, which measure 1-dimensional information and 2-dimensional information simultaneously from a target of inspection, and then re construct 3-dimensional information. So we can find the situation in progress and predict remaining life and corrosion without destructive examination. It's a point of excellence that the 3-dimensional measuring machine is portable.

13:00 – 13:50

D-FMP-06

### Bias Compensation Algorithm of Acceleration Sensor on Galloping Measurement System

Hwan-Seong Kim(Kmaritime Univ.), Gi-Sig Byung(Pukyong Univ.), Sang-Gyun So(Hanbat Univ.)

In this paper, we deal with two bias compensation algorithms of acceleration sensor for measuring the galloping on power transmission line. Firstly, the block diagram of galloping measurement system is given and a galloping model is presented. Secondly, two compensation algorithms, a simple compensation and a period compensation, are proposed. A simple compensation algorithm use the drafts of velocity and distance at fixed periods, so it is useful for constant bias case. Next, a period compensation algorithm can compensate a periodic bias. This algorithm use the previous measured data and compensated data for constant period, where the period is obtained by FFT method. Lastly, the effectiveness of proposed algorithms is verified by comparing between two algorithms in simulation, and its characteristics and the bias error bound are shown, respectively.