I-FA05 Sensors and Measurements 1

09:00-11:00 **Chair : Shida Katsunori (Saga Univ.)**
Room : C204 **Co-Chair : Matsuda Toyonori (Kumamoto National College of Technology)**

09:00 – 09:20 **I-FA05-1**

Velocity Measurement System Design Based on Quantization Error Constraint

Youngsun Chun
(Samsung Electronics Co.)

Combined with a counter, wheel or strip encoders which have equally divided markers are one of frequent measuring choices towards various applications in terms of cost, simplicity, and diversity of measurements, e.g., measuring displacement, velocity, acceleration, and so on. Often, velocity is measured by counting the series of reference clocks for a period of time which sensor-carrying device took for traveling two adjacent encoding markers. Quantizaion error of such that the disturbance caused by quantization error is under control. This paper identifies design issues, developes theory, and proposes a paradigm to design a velocity measurement system such ...

09:20 – 09:40 **I-FA05-2**

Presentation of a Fault Detecting Method for Power Transmission Line using M-sequence

E. NISHIYAMA and K. KUWANMI
(Kumamoto National College of Technology, Nishigoshi-cho)

The method of pinpointing the place of the abnormalities of a power transmission system analyzes the voltage and the current information from the both ends of a power line[1-2]. Now, there are only current and a voltage measuring instrument every about 20km, and the present condition is specifying the breaking down point by viewing of a worker in it. In this research, a power line circuit is assumed to be a line type system, and M-sequence is impressed to the end, it receives at other ends, the crosscorrelation function of input and output is taken, an impulse response is calculated, and the method in comparison with the time of normal is proposed. By this technique...

09:40 – 10:00 **I-FA05-3**

Design Parameter Optimization for Hall Sensor Application

Chang-Sung Choi, Gi-Ho Cha, Hyun-Soon Kang and Chang-Sup Song (Fairchild Korea Semiconductor)

Hall effect sensor using 7um, 1.7 ohm-cm or 10um, 3.5 ohm-cm Bipolar process was successfully developed. The Hall sensor consists of various patterns, such as regular shapes, rectangles, diamond, hexagon and cross shapes to optimize offset voltage and sensitivity for proper applications. In order to measure offset voltage in chip scale the Agilent company's 4156C and Nano-Voltage Meter were used and the best structure in offset voltage was finally selected by using ceramic package. The patterns appear to be the quadri-rectangular patterns entirely and three- parallelogram patterns. The measured offset voltages were found to be about 173 ~365uV. Meanwhile, in ...

10:00 – 10:20 **I-FA05-4**

Visualization Analysis of Correlation between Fiber Orientation Angles and Flow Patterns by Gate-Magnetization Method

Hidekazu MIYAUCHI, Masaaki IMADE, Saburo OKADA(National Institute of Advanced Industrial Science and Technology), Hidetoshi YOKOI(University of Tokyo)

This paper presents the results of a visualization analysis of the correlation between the fiber orientation and flow pattern in injection molding using the Gate-magnetization method developed for the precise visualization of melt flow. The results of the comparisons of the fiber orientation angles with the flow patterns by the Gate-Magnetization method for GPPS mixed with glass fibers show the strong correlation between the flow patterns and fiber orientation angles. According to forward movement of the flow, the fiber orientation patterns move toward the side walls following the flow patterns. These results elucidate that fibers are oriented in the expansion process of the melt, and ...

10:20 – 10:40 **I-FA05-5**

Modeling and Simulation for Level & Flow Control System Using Microcontroller

Sumalee UNHAVANICH , Teerasilapa DUMAWIPATA(IET, KMITNB), Worapong TANGSRIRAT(KMITL)

This work describes a design and implementation of the level & flow rate control system by using a single-chip microcontroller. The proposed model system is designed based on the use of the single-chip microcontroller 8031 with the EPROM emulator for programming the computer software. The microcontroller reaches the input level and flow signals from the level sensor and the turbine flowmeter, respectively, via the signal conditioning circuits and A/D converters in order to calculate the control signal. Moreover, the status of the process variable can easily be set up and controlled by program monitoring through the emulator, and can be graphically displayed on the computer screen. Experiment results were carried out which can be ...

10:40 – 11:00 **I-FA05-6**

A novel method for discriminating between water and oil using the temperature dependence of ultrasonic travel time

Guo Wei and Katsunori Shida
(Saga Univ.)

For discriminating between water and oil, a novel method is proposed in this paper. As a fundamental result, the temperature dependence of ultrasonic travel time of water and oil measured from 5℃ to 40℃ at a step of 5℃ is found as that the ultrasonic travel time of oil increases with increasing temperature, whereas that of water decreases. The proposed method for discriminating between water and oil is based on the opposite temperature dependence of ultrasonic travel time of water and oil. Besides the advantages of non-invasion and on-line measurement, there are no requirements of measuring the temperature of liquid being detected and obtaining previously a large quantity of database, and furthermore, only two times of measurements are ...