

I-SA07

Control Device Smart Actuators

09:00-11:00

Chair : Takashi Fujimoto (Kyushu Sangyo Univ.)

Room : C207

Co-Chair : Kyihwan Park (KJIST)

09:00 – 09:20

I-SA07-1

Switching Angle Control of a High Speed Switched Reluctance Motor using an FPGA Circuit

Changhwan Choi, Yongdae Kim, and Kyihwan Park (Kwangju Institute of Science and Technology)

This paper presents a high performance and cost effective way by using an FPGA circuit to implement torque controller so that the SRM can operate at high speed. In order to increase the operating speed, we need to implement both the torque and the current controllers by using an FPGA. However, it is difficult to implement all of the torque controller in the FPGA. Moreover, implementation of a time critical part is sufficient for improving the performance. One of the time critical part is the switching angle control. In this study, torque controller which calculate the switching on and commutation angles is implemented in PC because these angle are a function of rotor velocity which is varied slowly, and switching angle controller ...

09:40 – 10:00

I-SA07-3

Vibration control of a framed structure by an air-pulse actuator

T. Fujimoto(Kyushu Sangyo),
Cao Fengying, and Y.Mori (Kyushu Sangyo Univ.)

This paper describes an application of an air-pulse actuator for vibration control of a framed structure. Dynamic characteristics of the prototype actuator that utilizes an airjet reaction force pulsated by an electromagnetic valve were investigated to use it as a control actuator. Using a control law based on the sliding mode control theory, experiments of the vibration control were carried out. The experimental results verified the validity of the actuator performance.

09:20 – 09:40

I-SA07-2

Comparison Study of EMI and Switching Loss Reductions of Unipolar and Improved Limited Unipolar Switching Circuits

A.Srisawang, S.Thanasana, Y.Prempraneerach
(King Mongkut's Institute of Technology Ladkrabang)

This paper investigates the effect of the conducted EMI (Electromagnetic Interference) and the switching loss which occurs from the switching devices in the switching period of the unipolar and limited unipolar switching circuits. The three main sources of conducted EMI and switching loss in the unipolar and limited unipolar switching circuit come from the switching devices, the number of switching times in the switching period and their switching waveform. In this paper, these three parameters are used to determine the conducted EMI which generated from the unipolar and limited unipolar switching circuits and to improve the limited unipolar switching circuit which uses the power MOSFET's as the switching devices. The significant reduction of the conducted EMI ...

10:00 – 10:20

I-SA07-4

Using FPGA for Real-Time Processing of Digital Linescan Camera

Heon Jeong, Nam-Chae Jung(Chodang univ.)
Han-Soo Choi(Chosun Univ.)

We investigate, in this paper, the use of FPGA(Field Programmable Gate Array) architectures for real-time processing of digital linescan camera. The use of FPGAs for low-level processing represents an excellent tradeoff between software and special purpose hardware implementations. A library of modules that implement common low-level machine vision operations is presented. These modules are designed with gate-level hardware components that are compiled into the functionality of the FPGA chips. This new synchronous unidirectional interface establishes a protocol for the transfer of image and result data between modules. This reduces the design complexity and allows several different low-level operations to be applied to the same input image ...
