

# FE04

## Manufacturing I

15:40-17:40

Room : 1st Floor-Wilder Kaiser

Chair1 : Jochen Manfred Quick ( NTU, Singapore )

Chair2 : Kee young Choi ( Inha Univ., Korea )

15:40 – 16:00

FE04-1

FE04-2

### Automation of Solid Freeform Fabrication System

SangHyun Min, TaiJoon Um(Soonchunhyang Univ., KOREA)

#### 1. Introduction

Present study presents the basic concept of a Solid Freeform Fabrication System using a rapid prototyping procedure and optimal control for a transferring and accumulating system. And it developed a novel rapid prototyping process that can use ceramic or metal as well as polymer as a basic material.

#### 2. Solid Freeform Fabrication System

##### 2.1 Basic Theory

A 3D CAD data of the model is converted to the 2D cross-section data of the slides. A ceramic or metal tape of thickness 0.5-1.5mm is cut by a laser beam with the cross-section data of the slide. A 3D model was obtained by transferring and accumulating the slides. The final product is manufactured by sin...

16:00 – 16:20

### ICA based Thermal Source Extraction and Thermal Distortion Compensation for Machine Tools

Dong Soo Lee, Jin Young Choi, Doo-Hyun Choi(Seoul Nat'l Univ., KOREA)

- Machine tools
- Thermal distortion compensation
- Independent component analysis
- Temperature variable reduction
- Thermal distortion modeling
- Hardware Implementation
- Experiments

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16:40 – 17:00

FE04-4

### Design of IM Control System for Industrial Sewing Machines

Dae-kyu Hwang, Tae-Seok Oh, Il-Hwan Kim(Kangwon Nat'l Univ., KOREA)

This paper describes a design of an induction motor control system for industrial sewing machines. On the basis of vector control principle, the control system is simulated by using the ACSL, implemented on a DSP(TMS320C31). A space vector modulation is used as the inverter switching strategy. For the application of industrial sewing machines, A fast acceleration (deceleration) and removal of velocity ripples are required, because a sewing quality and sewing machines life time depends on these characteristics. The designed control system has fast dynamic characteristics and small speed vibration. The result is applied to the industrial sewing machine and result are shown

### Realization of a Remote Management System for Process Inspection of Chip-Mounter

Sun Jong Lim(KIMM, KOREA), Joon Lyon(Chungnam Nat'l Univ., KOREA)

Today, Internet offers WWW(World Wide Web), remote control, file transfer and e-mail service. Among the services, WWW takes large portion because of convenient GUI, easy information search and unlimited information registration. WWW service gives the comfort in life such as goods purchase, information search, real-time news, internet TV and medical diagnosis. Remote Monitoring Server(RMS) Ssystem that uses internet and WWW is constructed for chip mounter. Hardware base consists of RMS, chip mounter and C/S(Customer Service) service. Software includes DBMS and various modules in server home page. Web browser provide product number, bad product number, troubl...

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17:20 – 17:40

FE04-6

### Monitoring of discrete simulation and workflow events using virtual environments

Jochen Manfred Quick(NTU, SINGAPORE)

- Visualization
- Animation
- Simulation
- Software Components
- Workflow Management

### Improvement of Optical Disk Controller Using a MEMS Accelerometer

Keeyoung Choi, Sunghee Kim(Inha Univ., KOREA), Jintai Chung(Hanyang Univ., KOREA)

- Simulation of the effect of external vibration on optical disk pickups.
- Vibration effect is cancelled with acceleration feedforward.
- MEMS accelerometers are small enough not to require any mechanical design modification.
- LQR, LQG, and SMC type controllers are designed.
- With the feedforward, transmissibility is reduced significantly.
- Time domain simulation confirms the performance enhancement.
- The resultant system shows excellent command following characteristics as well.

