

IIP/ISPS Joint MIPE2009 Conference Schedule

Tsukuba International Congress Center, Ibaraki, Japan

6/17 (Wed.) – 20 (Sat.)

6/17 (Wed.)

15:00 to 17:00	Registration
18:00 to 20:00	Welcome reception at Restaurant (1F)

6/18 (Thur.)

8:00 to 17:00		Registration			
8:50 to 9:00		Opening Remarks from Prof. Fukui at Room1			
	Room1 (201A)	Room2 (201B)	Room3 (202A)	Room4 (202B)	
9:00 to 10:40	Intelligent Machines I Oral Presentations (INT-01 to 05)	Servo Control I Oral Presentations (SVC-01 to 05)	9:20 to 10:40 Head/Disk Interface and Tribology I Oral Presentations (HDI-01 to 04)	Flexible Media Feeding and Handling Machines I Oral Presentations (FMF-01 to 05)	
10:40 to 11:00 BREAK					
11:00 to 12:20	Intelligent Machines II Keynote Address (Prof. OHKA) Oral Presentations (INT-06 to 07)	Servo Control II Keynote Address (Prof. CALLAFON) Oral Presentations (SVC-06 to 07)	Head/Disk Interface and Tribology II Oral Presentations (HDI-05 to 08)	Flexible Media Feeding and Handling Machines II Oral Presentations (FMF-06 to 09)	
12:20 to 13:50 LUNCH					
13:50 to 15:10	Poster Session at Room5 (406, 4F)				
15:10 to 15:30 BREAK					
15:30 to 16:50	Intelligent Machines III Oral Presentations (INT-08 to 11)	Micro/Nanosystem Science and Technology I Oral Presentations (MNS-01 to 04)	Head/Disk Interface and Tribology III Oral Presentations (HDI-09 to 12)	Flexible Media Feeding and Handling Machines III Keynote Address (Prof. HASHIMOTO) Oral Presentations (FMF-10 to 11)	
16:50 to 17:10 BREAK					
17:10 to 18:30	Intelligent Machines IV Oral Presentations (INT-12 to 15)	Micro/Nanosystem Science and Technology II Oral Presentations (MNS-05 to 08)	Head/Disk Interface and Tribology IV Oral Presentations (HDI-13 to 16)	Flexible Media Feeding and Handling Machines IV Oral Presentations (FMF-12 to 15)	

6/19 (Fri.)

8:00 to 17:00				
Registration				
	Room1 (201A)	Room2 (201B)	Room3 (202A)	Room4 (202B)
9:00 to 10:40	Drive Mechanisms I Oral Presentations (DVM-01 to 05)	Micro/Nanosystem Science and Technology III Oral Presentations (MNS-09 to 13)	9:00 to 10:20 MM/Micro/Nano Precision Equipments I Keynote Address (Prof. OOHIRA) Oral Presentations (PRE-01 to 02)	Bio-medical Equipments I Keynote Address (Prof. MASAMUNE) Oral Presentations (BIO-01 to 03)
			10:40 to 11:00 BREAK	
11:00 to 12:20	Drive Mechanisms II Oral Presentations (DVM-06 to 09)	Micro/Nanosystem Science and Technology IV Keynote Address (Dr. NAKANO) Oral Presentations (MNS-14 to 15)	MM/Micro/Nano Precision Equipments II Oral Presentations (PRE-03 to 06)	Bio-medical Equipments II Oral Presentations (BIO-04 to 07)
12:20 to 13:50 LUNCH				
13:50 to 18:00	Workshop at Convention Hall 300 (3F)			
18:00 to 18:30 Photography at Entrance Hall (1F)				
18:30 to 20:30 Banquet at Multi-Purpose Hall (1F)				

6/20 (Sat.)

8:00 to 16:00				
Registration				
	Room1 (201A)	Room2 (201B)	Room3 (202A)	Room4 (202B)
9:00 to 10:40	9:40 to 10:40 Drive Mechanisms III Oral Presentations (DVM-10 to 12)	Simulations of Micro/Nano Scale Phenomena I Keynote Address (Dr. SASAKI) Oral Presentations (SIM-01 to 03)	9:40 to 10:40 MM/Micro/Nano Precision Equipments III Oral Presentations (PRE-07 to 09)	Bio-medical Equipments III Oral Presentations (BIO-08 to 12)
11:00 to 12:20	Drive Mechanisms IV Oral Presentations (DVM-13 to 16)	Simulations of Micro/Nano Scale Phenomena II Oral Presentations (SIM-04 to 07)	MM/Micro/Nano Precision Equipments IV Oral Presentations (PRE-10 to 13)	Micro/Nanomechatronics I Keynote Address (Prof. WASHIZU) Oral Presentations (MCH-01 to 02)
12:20 to 13:50 LUNCH				
13:50 to 15:10	13:50 to 14:30 Imaging and Printing Technologies I Oral Presentations (IMG-01 to 02)	Simulations of Micro/Nano Scale Phenomena III Oral Presentations (SIM-08 to 11)	Optical Storage/Optical Devices for Storage I Keynote Address (Dr. MATSUMOTO) Oral Presentations (OPT-01 to 02)	14:10 to 15:10 Micro/Nanomechatronics II Oral Presentations (MCH-03 to 05)
	14:30 – 14:50 BREAK			
15:30 to 16:50	14:50 to 16:10 Imaging and Printing Technologies II Oral Presentations (IMG-03 to 06)	15:10 to 15:30 BREAK		Micro/Nanomechatronics III Oral Presentations (MCH-06 to 9)
		15:30 to 16:30 Simulations of Micro/Nano Scale Phenomena IV Oral Presentations (SIM-12 to 14)	Optical Storage/Optical Devices for Storage II Oral Presentations (OPT-03 to 06)	
16:50 to 17:10 BREAK				
17:10 to 18:10				Micro/Nanomechatronics IV Oral Presentations (MCH-10 to 12)

Workshop

6/19 (Fri.) 13:50 – 18:00 (Convention Hall 300)

For a construction of future technology -From “micro-nano” to “intelligence”-

Organizers: T. Sato (Tokyo Denki Univ.), S. Saegusa (Hiroshima Univ.), K. Toma (Panasonic),
S. Shen (Univ. of Washington), N. Schirle (HGST)

One of the fundamental fields related to this international conference is Micro-Nano Science and Engineering. This field together with MEMS/NEMS technologies can be used as a basis for constructing ultra-precision devices for information processing and other applications. Information-processing devices are an example of how information and precision-element technologies can progress by combining basic research in the micro/nano field with micro/nano technologies. A rich information-based society can be created through the systematic convergence and synthesis of various types of information-related devices. Information and precision-element technologies will also pave the way to the development of intelligent systems. Finally, linking intelligent machines with human brain research is important for the advancement of intelligent systems and the creation of even better man-machine interfaces.

In this workshop, we will hear from well-known researchers in representative technologies that are part of this stream, and about future directions for these technologies. It will conclude with comprehensive discussions examining this development stream from an overall perspective.

Co-Chairs: Professor Hiroshi Takahashi, Shonan Institute of Technology, Japan
Professor Frank E. Talke, UCSD, USA

13:50 – 14:00

Opening Address

Kazushi Yoshida (Hitachi Ltd., Chair of IIP division, Japan)

14:00 – 14:40 WS-01

MEMS Science: An Attractive Area Providing a Plenty of Room for Multidisciplinary Research

Kazuo Sato (Professor, Nagoya University, Japan)

Textbooks and common sense still have to be rewritten in MEMS areas, because knowledge is not matured in micro/nano science. Examples are presented in wet etching of silicon and fracture of silicon microstructures. It is argued that interdisciplinary research collaboration is quite effective and essential for solving such problems.

14:40 – 15:20 WS-02

MEMS/NEMS Technologies and Information Devices

Liwei Lin (Chancellor's Professor, University of California at Berkeley, USA)

In the past decades, the application of microelectronic technology to the fabrication of mechanical devices stimulated emerging research in micro/nano sensors and actuators. The versatility of semiconductor materials and the miniaturization of VLSI patterning techniques promise new systems with better capabilities and improved performance-to-cost ratio over those of conventionally machined devices. This talk will discuss MEMS/NEMS technologies and its applications to information devices, such as the design, fabrication and testing of MEMS/NEMS force and strain sensors to monitor disk/head contacts. Specifically, a micro pressure sensor and a pitch and roll motion sensor have been designed, fabricated and tested for possible applications in the field of information devices.

15:20 – 16:00 WS-03

A Forward Look: HDD Mechanical Technology Evolution in the Expanding Data Storage Universe

Nils Larson (Sr. Director of Mechanical Engineering, Western Digital, USA)

Rotating magnetic data storage systems are providing solutions in a growing digital world, facing expanding challenges in satisfying end-user needs. Various critical customer attributes are explored and how HDD mechanical technology is evolving to meet these needs.

(16:00 – 16:20 BREAK)

16:20 – 17:00 WS-04

Multi-layered Intelligent Support for Active Safety of Transport Systems

Toshiyuki Inagaki (Professor, University of Tsukuba, Japan)

This paper discusses the need for multi-layered support for assuring active safety of transport systems. It also argues that a machine-initiated trading of authority may be indispensable even in the framework of human-centered automation.

17:00 – 17:40 WS-05

Measurement of electromagnetic signals generated from the human brain

Yoshinori Uchikawa (Professor, Tokyo Denki University, Japan)

The measurement of electromagnetic fields, using SQUID magnetometer, generated by activation of the human brain and application to the interface technology of the human adaptive mechatronics (HAM) system are introduced.

17:40 – 18:00

Panel Discussion

Closing Address

Technical Program of Oral Presentations

6 / 18

Room 1 (201A)

6 / 18 Room 1 (201A)

Intelligent Machines I (9:00 – 10:40)

Chair: Prof. Hiroshi TAKAHASHI (Shonan Institute of Technology, Japan)

9:00 - 9:20 INT-01

A STUDY ON A SUBLIMINAL ALARM FOR CAREFUL DRIVING

Hiroshi TAKAHASHI

Shonan Institute of Technology, Japan

9:20 - 9:40 INT-02

CONTROL OF HUMAN GENERATING FORCE BY USE OF ACOUSTIC INFORMATION - STUDY ON ARTIFICIAL SOUNDS FOR SMALL FORCE CONTROLS

Miki IIMURA¹, Taichi SATO¹, Kihachiro TANAKA²

1: Tokyo Denki University, Japan

2: Saitama University, Japan

9:40 - 10:00 INT-03

HUMAN BEHAVIOR RECOGNITION BY USING FOOT PRESSURE SENSING SHOES

Chika SUGIMOTO, Kenji OZAKI, Ryosuke EZOE, Hiroshi HOSAKA, Hiroyuki YAMATO

The University of Tokyo, Japan

10:00 - 10:20 INT-04

ADAPTIVE COOPERATION USING INTERACTION OF MULTI-AGENT SYSTEM

Yoshihiro MURATA, Hiroshi IGARASHI

Tokyo Denki University, Japan

10:20 - 10:40 INT-05

DEVELOPMENT OF TRIPOD PARALLEL MECHANISM

Yoshito TANAKA¹, Yasunobu HITAKA¹, Yutaka TANAKA², Ken ICHIRYU³

1: Kitakyushu National College of Technology, Japan

2: Hosei University, Japan

3: Kikuchi Seisakusho, Japan

(10:40 – 11:00 BREAK)

6 / 18 Room 1 (201A)

Intelligent Machines II (11:00 – 12:20)

Chair: Prof. Hiroshi IGARASHI (Tokyo Denki University, Japan)

11:00 - 11:40 INT-K ***Keynote Address***

INTELLIGENT TACTILE SENSING INSPIRED BY COMPLEX SYSTEMS SCIENCE

Masahiro OHKA

Nagoya University, Japan

11:40 - 12:00 INT-06

STUDY ON EFFICIENT PHS POSITION TRACKING SYSTEM FOR TRANSPORT EQUIPMENTS USING ACCELEROMETER AND SUPERVISED MACHINE LEARNING

Hiroshi YOSHIDA, Yasuhiro KAWAHARA, Hiroshi HOSAKA
The University of Tokyo, Japan

12:00 - 12:20 INT-07

PRECISE POSITIONING METHOD FOR LOGISTIC TRACKING SYSTEMS USING PHS BASED ON MAHALANOBIS DISTANCE

Naoaki YOKOI, Yasuhiro KAWAHARA, Hiroshi HOSAKA
The University of Tokyo, Japan

(12:20 – 13:50 LUNCH)

13:50 – 15:10 POSTER SESSION

(15:10 – 15:30 BREAK)

6 / 18 Room 1 (201A)

Intelligent Machines III (15:30 – 16:50)

Chair: Prof. Jen-Yuan Chang (Massey University, New Zealand)

15:30 - 15:50 INT-08

DEVELOPMENT OF INTELLIGENT HARDNESS MEASUREMENT MACHINE

Montree PAKKRATOKE, Tassanai SANEPONPUT, Rugkanawan KONGKAVITTOOL,
Apichaya MEESAPLAK
National Institute of Metrology, Thailand

15:50 - 16:10 INT-09

CONTROL METHOD FOR PZT PIEZOELECTRIC ACTUATOR USING MULTI-LAYER NEURAL NETWORK INCLUDING FEEDBACK CONNECTION

Masahiro OHKA¹, Kazuya ESUMI¹, Yasuhiro SAWAMOTO²
1: Nagoya University, Japan
2: Molex Japan Co. Ltd., Japan

16:10 - 16:30 INT-10

TWO-WHEELED ACTIVE INERTIA CONTROLLED ROBOT FOR AGRICULTURE PEST CONTROL APPLICATION

Hamid Reza MEMARBASHI, Jen-Yuan (James) CHANG
Massey University, New Zealand

16:30 - 16:50 INT-11

MANIPULATOR CONTROL WITH FLEXIBLE OBJECTS MODEL BY NEURAL NETWORK

Mitsutoshi TOGASAKI, Hiroshi IGARASHI
Tokyo Denki University, Japan

(16:50 – 17:10 BREAK)

6 / 18 Room 1 (201A)

Intelligent Machines IV (17:10 – 18:30)

Chair: Prof. Masahiro OHKA (Nagoya University, Japan)

17:10 - 17:30 INT-12

COOPERATIVE TRANSPORTATION TASK BY MULTI-ROBOTS WITH LEADER SELECTION

Yoshitaka TOHYAMA, Hiroshi IGARASHI
Tokyo Denki University, Japan

17:30 - 17:50 INT-13

EXTERNAL SKELETON TYPE UPPER-LIMBS MOTION INSTRUCTION SYSTEM

Ryota SAKAMOTO¹, Yuki YOSHIMURA¹, Tokuhiro SUGIURA², Yoshihiko NOMURA³

1: Mie University, Faculty of Engineering, Japan

2: Mie University, Center for Information Technologies and Networks, Japan

3: Mie University, Japan

17:50 - 18:10 INT-14

DEVELOPMENT OF AN ON-LINE DIGITAL OPTICAL BENCH TESTER WITH CONOSCOPY FOR LENS QUALITY EVALUATION

Lun-De LIAO, Wei-Huesh HSU, Paul C.-P, CHAO, Yan-Pean HUANG

National Chiao Tung University, Taiwan

18:10 - 18:30 INT-15

DEVELOPMENT OF GUIDE-DOG ROBOT (SECOND REPORT), - LEADING AND RECOGNIZING A VISUALLY HANDICAPPED PERSON USING LRF-

Shozo SAEGUSA¹, Yuya YASUDA¹, Yoshitaka URATANI¹, Eiichirou TANAKA², Toshiaki MAKINO³

1: Hiroshima University, Japan

2: Shibaura Institute of Technology, Japan

3: Tokuyama National College of Technology, Japan

6 / 18
Room 2 (201B)

6 / 18 Room 2 (201B)

Servo Control I (9:00 – 10:40)

Chair: Prof. Raymond A. de Callafon (University of California, San Diego, USA)

9:00 - 9:20 SVC-01

FINAL-STATE CONTROL USING SAMPLED-DATA POLYNOMIAL FOR HARD DISK DRIVES

Mitsuo HIRATA, Fujimaru UENO
Utsunomiya University, Japan

9:20 - 9:40 SVC-02

FEEDFORWARD CONTROL DESIGN FOR SEEK CONTROL USING NME PROFILER AND INPUT SHAPING

Yoshihito KINOSHITA¹, Yuichi CHIDA¹, Yoshiyuki ISHIHARA²
1: Shinshu University, Japan
2: Toshiba, Japan

9:40 - 10:00 SVC-03

STABLE PEAK FILTERING METHOD TO REJECT HIGH FREQUENCY DISTURBANCE IN HARD DISK DRIVES

Fan HONG, Chunling DU
Data Storage Institute, Singapore

10:00 - 10:20 SVC-04

A RUN-OUT ORIENTED CONTROLLER DESIGN FOR NANOSCALE SERVO SYSTEMS OF HARD DISK DRIVES

Jun ISHIKAWA
Tokyo Denki University, Japan

10:20 - 10:40 SVC-05

SERVO PREDICTION AND HIGH POSITION UPDATE RATE TO SUPPORT 10 TERABIT/SQ-IN PATTERNED MEDIA TECHNOLOGY

Wai Ee WONG, Fan HONG, Jul Nee TEOH, Songhua ZHANG, Yu LIN
Data Storage Institute, Singapore

(10:40 – 11:00 BREAK)

6 / 18 Room 2 (201B)

Servo Control II (11:00 – 12:20)

Chair: Prof. Mitsuo Hirata (Utsunomiya University, Japan)

11:00 - 11:40 SVC-K **Keynote Address**

ROBUST ESTIMATION AND ADAPTIVE CONTROLLER TUNING FOR VARIANCE MINIMIZATION IN SERVO SYSTEMS

Raymond Arnoud de CALLAFON
University of California, San Diego, USA

11:40 - 12:00 SVC-06

A SIGNIFICANT IMPROVEMENT TO TAPE DRIVE PES BY CANCELING LTM WITH A ROBUST, HIGH PERFORMANCE CONTROLLER

Charles Edward KINNEY, Raymond Arnoud de CALLAFON
University of California, San Diego, USA

12:00 - 12:20 SVC-07

MODELING AND CONTROL OF A DUAL STAGE ACTUATOR HARD DISK DRIVE

Uwe BOETTCHER, Raymond Arnoud de CALLAFON, Frank E. TALKE
University of California, San Diego, USA

(12:20 – 13:50 LUNCH)

13:50 – 15:10 POSTER SESSION

(15:10 – 15:30 BREAK)

6 / 18 Room 2 (201B)

Micro/Nanosystem Science and Technology I (15:30 – 16:50)

Chair: Prof. Kenji SUZUKI (Kogakuin University, Japan)

15:30 - 15:50 MNS-01

REDUCTION OF ADHESION BETWEEN STEEL AND GRILLED FISH PROTEIN WITH ULTRA-HYDROPHOBIC DLC

Naoko HONDA¹, Makoto KAJIYA², Young-Jun JANG¹, Hiroyuki Kousaka¹, Noritsugu UMEHARA¹

1: Nagoya University, Department of Mechanical Science and Engineering, Japan

2: Nagoya University, Department of Mechanical and Aerospace engineering, Japan

15:50 - 16:10 MNS-02

THE EFFECT OF ULTRAVIOLET RAY IRRADIATION ON CN_x COATING'S TRIBOLOGICAL PROPERTY

Takayuki TOKOROYAMA¹, Makoto KAMIYA¹, Noritsugu UMEHARA¹, Yoshio FUWA²

1: Nagoya University, Japan

2: Toyota Motors Co., Ltd., Japan

16:10 - 16:30 MNS-03

THE EFFECT OF MICRO-TEXTURING ON TRIBOLOGICAL PROPERTIES

Miki NAKANO¹, Koji MIYAKE¹, Atsushi KORENAGA¹, Yasuhisa ANDO¹, Shinya SASAKI^{1,2}

1: National Institute of Advanced Industrial Science and Technology (AIST), Japan

2: Tokyo University of Science, Japan

16:30 - 16:50 MNS-04

MECHANICAL AND TRIBOLOGICAL PROPERTIES OF NANOSTRUCTURED Cr-C-N_x FILMS GROWN AT VARYING NITROGEN CONCENTRATION

Anand VYAS¹, Lawrence LI²

1: The Hong Kong Polytechnic University, Hong Kong

2: City University of Hong Kong, Hong Kong

(16:50 - 17:10 BREAK)

6 / 18 Room 2 (201B)

Micro/Nanosystem Science and Technology II (17:10 – 18:30)

Chair: Dr. Takayuki TOKOROYAMA (Nagoya University, Japan)

17:10 - 17:30 MNS-05

ENHANCED RAMAN SPECTROSCOPIC ANALYSIS OF ULTRA-THIN PLASMA CVD DIAMOND-LIKE CARBON FILMS USING MOLECULAR SENSOR WITH PLASMON ANTENNA

Masahiro YANAGISAWA¹, Naonobu SHIMAMOTO², Toshiyuki AIDA¹, Mikiko SAITO², Kunio KATO², Masaki SUZUKI³, Tetsuya OSAKA⁴, Naoto OHTAKE³

- 1: Waseda University, Institute for Biomedical Engineering, Japan
- 2: Waseda University, Nanotechnology Research Laboratory, Japan
- 3: Tokyo Institute of Technology, Japan
- 4: Waseda University, Faculty of Science and Engineering, Japan

17:30 - 17:50 MNS-06

DEVELOPMENT OF VAN DER POL-TYPE SELF-EXCITED FM-AFM (VDP-AFM)

Masaharu KURODA¹, Takashi SOMEYA², Hiroshi YABUNO³

- 1: National Institute of Advanced Industrial Science and Technology (AIST), Japan
- 2: Mitsubishi Heavy Industries Ltd., Japan
- 3: Keio University, Japan

17:50 - 18:10 MNS-07

FREE VIBRATION ANALYSIS OF CARBON NANOTUBES AND GRAPHENE SHEETS USING MOLECULAR STRUCTURAL MECHANICS APPROACH

Ramin VATANKHAH, Kamyar HASHEMNIA, Mehrdad FARID
Shiraz University, Iran

18:10 - 18:30 MNS-08

NANOWEAR CHARACTERISTICS OF CARBON NANOTUBE FILM MADE BY SURFACE DECOMPOSITION OF SiC

Yosuke TSUKIYAMA¹, Noritsugu UMEHARA¹, Michiko KUSUNOKI²

- 1: Nagoya University, Department of Mechanical Science and Engineering, Japan
- 2: Nagoya University, EcoTopia Science Institute, Japan

6 / 18
Room 3 (202A)

6 / 18 Room 3 (202A)

Head / Disk Interface and Tribology I (9:20 – 10:40)

Chair: #####

9:20 - 9:40 HDI-01

" DAMPING SLIDER " AIR-BEARING DESIGN CONCEPTS AND SLIDER DEVELOPMENT

Yuki SHIMIZU, Junguo XU, Jianhua LI, Kyosuke ONO
Hitachi Ltd., Japan

9:40 - 10:00 HDI-02

AIR BEARING DESIGN SUPPRESSING REVERSE FLOW FROM THE TRAILING EDGE OF THE SLIDER

Jianhua LI, Junguo XU, Yuichi AOKI
Hitachi Ltd., Japan

10:00 - 10:20 HDI-03

AN ANALYSIS OF THE DIMPLE/GIMBAL CONTACT IN A HARD DISK DRIVE SUSPENSION

Longqiu LI¹, Izhak ETSION², Edmund B. FANSLAU³, Frank TALKE⁴

- 1: Harbin Institute of Technology, China.
- 2: Technion-Israel Institute of Technology, Israel
- 3: NHK International Corp., USA
- 4: University of California, San Diego, USA

10:20 - 10:40 HDI-04

THERMAL - MECHANICAL ANALYSIS OF DFH CONSIDERING ABS SHAPES AND ABS PRESSURE

Hidetoshi MATSUI, Zhisheng DENG
1. TDK Corporation Technical Center, Japan
2. SAE Magnetism (H.K.) Ltd., Hong Kong

(10:40 – 11:00 BREAK)

6 / 18 Room 3 (202A)

Head / Disk Interface and Tribology II (11:00 – 12:20)

Chair: #####

11:00 - 11:20 HDI-05

HIGH-SPEED TRIBOLOGICAL MEASUREMENT OF PFPE LUBRICANT FILM BY USING OSCILLATING OPTICAL FIBER PROBE

Koki IMAI¹, Shintaro ITOH¹, Kenji FUKUZAWA¹, Yuya HAMAMOTO¹, Hedong ZHANG²

- 1: Nagoya University, Graduate School of Engineering, Japan
- 2: Nagoya University, Graduate School of Information Science, Japan

11:20 - 11:40 HDI-06

EFFECT OF ULTRAVIOLET IRRADIATION ON ADHESIVE FORCE AND ELONGATION OF MONOLAYER LUBRICANT FILMS COATED ON MAGNETIC DISK SURFACE

Yasuji OHSHIMA¹, Takashi SUMI², Hedong ZHANG², Yasunaga MITSUYA³, Kenji FUKUZAWA²

- 1: Aichi Konan College, Japan
- 2: Nagoya University, Japan
- 3: Nagoya Industrial Science Research Institute, Japan

11:40 - 12:00 HDI-07

CONFORMATION AND FUNDAMENTAL PROPERTIES OF NOVEL LUBRICANT TA-30 FOR NEAR CONTACT MAGNETIC RECORDING

Norio TAGAWA, Hiroshi TANI
Kansai University, Japan

12:00 - 12:20 HDI-08

STABILITY AND DEFORMATION OF THIN LIQUID FILM SURFACE (THREE-DIMENSIONAL ANALYSES FOR FREE SURFACE BETWEEN OPPOSED SOLID SURFACES)

Fumihiko SAEKI¹, Shigehisa FUKUI², Hiroshige MATSUOKA²

1: Tottori University, Graduate School of Engineering, Department of Design and Information Engineering, Japan

2: Tottori University, Graduate School of Engineering, Department of Mechanical and Aerospace Engineering, Japan

(12:20 – 13:50 LUNCH)

13:50 – 15:10 POSTER SESSION

(15:10 – 15:30 BREAK)

6 / 18 Room 3 (202A)

Head / Disk Interface and Tribology III (15:30 – 16:50)

Chair: #####

15:30 - 15:50 HDI-09

APPLICATION OF SQP METHOD IN DESIGNING THRUST AIR BEARING FOR HARD DISK DRIVE SPINDLE MOTOR

Mohd Danial IBRAHIM¹, Tadashi NAMBA¹, Masayuki OCHIAI², Hiromu HASHIMOTO²

1: Tokai University, Graduate School of Science and Engineering, Japan

2: Tokai University, Department of Mechanical Engineering, Japan

15:50 - 16:10 HDI-10

DAMAGE ON DISCRETE TRACK RECORDING MEDIA BY NORMAL / FRICTIONAL CONTACT

Yeoungchin YOON, Frank E. TALKE

University of California, San Diego, USA

16:10 - 16:30 HDI-11

AN EFFICIENT SIMULATION SCHEME FOR UNLOADING PROCESSES WITH APPLICATION TO PARAMETRIC STUDIES AND TREND ANALYSIS

Yan LIU, Hejun DU, Shao WANG

Nanyang Technological University, Singapore

16:30 - 16:50 HDI-12

THE ULTRA-THIN FILM LUBRICATION AT THE HEAD-DISK INTERFACE DURING LOAD/UNLOAD PROCESS OF HARD DISK DRIVES

Haodong WEI, Hongrui AO, Hongyuan JIANG

Harbin Institute of Technology, China

(16:50 – 17:10 BREAK)

6 / 18 Room 3 (202A)

Head / Disk Interface and Tribology IV (17:10 – 18:30)

Chair: #####

17:10 - 17:30 HDI-13

FEASIBILITY STUDY OF ULTRA-LOW PARTICLE CONTENT MEDIA OVERCOAT DEPOSITED BY FCA METHOD FOR 2 Tbps

Norikazu NAKAMURA, Shoichi MIYAHARA, Hiroshi CHIBA

Fujitsu Laboratories Ltd., Japan

17:30 - 17:50 HDI-14

INVESTIGATIONS OF MAGNETIC HEAD TOUCH DOWN BEHAVIOR ON WAVY SURFACE

Lizhi SU, Zhisheng DENG, Ringo Wing Kwong NG
SAE Magnetics (H.K.) Ltd, Hong Kong

17:50 - 18:10 HDI-15

EFFECTS OF ENVIRONMENTAL CONDITIONS ON TRIBOLOGICAL CHARACTERISTICS OF THIN-FILM DISKS

Kiyoto GYOURIKI¹, Youichi KAWAKUBO²
1: Shinshu University, Graduate School of Engineering, Japan
2: Shinshu University, Department of Mechanical Systems Engineering, Japan

18:10 - 18:30 HDI-16

ELECTRIC FIELD ASSISTED DIP COATING PROCESS OF ULTRA-THIN PFPE LUBRICANT FILM FOR MAGNETIC DISKS

Hiroshi TANI¹, Masami KUBOTA², Masayuki KANDA², Motohiro TERAOKA², Norio TAGAWA¹
1: Kansai University, Japan
2: Kubota Comps Co., Japan

6 / 18
Room 4 (202B)

6 / 18 Room 4 (202B)

Flexible Media Feeding and Handling Machines I (9:00 – 10:40)

Chair: #####

9:00 - 9:20 FMF-01

HIGH-SPEED SHEET FEEDING TECHNIQUE USING ULTRASONIC VIBRATION

Yuko KOBAYASHI, Kiminori TOYA, Hideki NUKADA, Masaki TAKAHASHI, Takehiko SUZUKI
Toshiba Corporation, Japan

9:20 - 9:40 FMF-02

EXPERIMENTAL INVESTIGATION OF AIR-BREATHING MECHANISM TO ENHANCE
PROXIMITY BETWEEN TRAVELING TAPE AND ACTIVE GUIDER

Riichi NAGAO, Jen-Yuan (James) CHANG,
Massey University, New Zealand

9:40 - 10:00 FMF-03

TESTING AND VALIDATION METHODS FOR COMPLEX MEDIA HANDLING SYSTEMS

Jongwoo KIM, Kiyoungh KIM
Nautilus Hyosung Inc., Republic of Korea

10:00 - 10:20 FMF-04

NUMERICAL ANALYSIS ON PAPER SHEET SEPARATION USING THE OVERLAP SEPARATION
MECHANISM

Hui CHENG, Hiroshi IKEDA, Kazushi YOSHIDA
Hitachi Ltd., Japan

10:20 - 10:40 FMF-05

PIEZO-ELECTRICALLY ACTUATED HIGH BANDWIDTH VIBRATION COMPENSATION FOR
MOVING MEDIA

Venkataraman KARTIK, Mark A. LANTZ, Evangelos ELEFThERIOU
IBM Zurich Research Laboratory, Switzerland

(10:40 - 11:00 BREAK)

6 / 18 Room 4 (202B)

Flexible Media Feeding and Handling Machines II (11:00 – 12:20)

Chair: #####

11:00 - 11:20 FMF-06

CONTACT CHARACTERISTICS OF A RUBBER ROLLER AND A FLEXIBLE MEDIUM

Kyosuke ONO
KO Dynamics Laboratory, Japan

11:20 - 11:40 FMF-07

CHARACTERISTICS OF PAPER FEEDING MECHANISM WITH A SHORT-RUBBER ROLLER
AND A FLAT PLATE

Hiroshi UMANO, Hiroshi YAMAURA
Tokyo Institute of Technology, Japan

11:40 - 12:00 FMF-08

WEB FLUTTER OF A THIN FILM IN A NARROW PASSAGE

Gaku KUDO, Masahiro WATANABE, Kensuke HARA
Aoyama Gakuin University, Japan

12:00 - 12:20 FMF-09

ACTIVE FEEDBACK CONTROL OF A WEB FLUTTER IN A NARROW PASSAGE

Yusuke HAYASHI, Masahiro WATANABE, Kensuke HARA
Aoyama Gakuin University, Japan

(12:20 – 13:50 LUNCH)

13:50 – 15:10 POSTER SESSION

(15:10 – 15:30 BREAK)

6 / 18 Room 4 (202B)

Flexible Media Feeding and Handling Machines III (15:30 – 16:50)

Chair: #####

15:30 - 16:10 FMF-K

Keynote Address

(TO BE DETERMINED)

Hiromu HASHIMOTO
Tokai University, Japan

16:10 - 16:30 FMF-10

CHARACTERISTICS OF AIR FILM SPACING AND FLOW VISUALIZATION FOR
TRANSPORTING FILM

Katsumi AOKI, Hiromu HASHIMOTO
Tokai University, Japan

16:30 - 16:50 FMF-11

THEORETICAL AND EXPERIMENTAL INVESTIGATIONS INTO GENERATION OF
WRINKLING AND SLIP IN PLASTIC-FILMS UNDER TRANSPORTATION

Hiromu HASHIMOTO
Tokai University, Japan

(16:50 – 17:10 BREAK)

6 / 18 Room 4 (202B)

Flexible Media Feeding and Handling Machines IV (17:10 – 18:30)

Chair: #####

17:10 - 17:30 FMF-12

IMPROVEMENT OF SLIPPAGE AND WRINKLING OF TRANSPORTING WEBS USING
MICRO-GROOVED ROLLERS

Shinji HIKITA¹, Hiromu HASHIMOTO²
1: Fujifilm Corporation, Japan
2: Tokai University, Japan

17:30 - 17:50 FMF-13

PREVENTION OF WOUND ROLL DEFECT OF COATED WEB

Toshimitsu KANDA¹, Shoko AKEMINE¹, Hiromu HASHIMOTO²
1: LINTEC Corporation, Japan
2: Tokai University, Japan

17:50 - 18:10 FMF-14

OPTIMUM WINDING TENSION AND NIP-LOAD INTO WOUND WEBS FOR PROTECTING WRINKLES AND SLIPPAGE

Hiromu HASHIMOTO¹, Puttha JEENKOUR², Mongkol MONGKOLWONGROJN²

1: Tokai University, Japan

2: King Mongkut's Institute of Technology Ladkrabang, Thailand

18:10 - 18:30 FMF-15

WEB WINDING SIMULATION AND WOUND ROLL STRESSES

Shigeo YANABE, Kengo TAKAHASHI, Toru YAMASHITA

Nagaoka University of Technology, Japan

6 / 19
Room 1 (201A)

6 / 19 Room 1 (201A)

Drive Mechanisms I (9:00 – 10:40)

Chair: #####

9:00 - 9:20 DVM-01

VCM DESIGN WITH ROUND COIL AND RECTANGULAR MAGNET FOR HARD DISK DRIVE ACTUATOR

Kenji SUZUKI¹, Mutsuro OHTA²

1: Hitachi Ltd., Japan

2: Hitachi Global Storage Technologies Japan, Ltd., Japan

9:20 - 9:40 DVM-02

OPTIMIZATION OF BASEPLATE HUB DESIGN FOR SWAGING OPERATION

K.C. EE, Peter HAHN, Brett HOLAWAY

Magnecomp Corporation, USA

9:40 - 10:00 DVM-03

A RELIABLE MAGNETIC LATCH DESIGN USING ELECTRO-MAGNETIC FORCE OF VCM ACTUATOR

Kyung-Ho KIM¹, Dongho OH², Bu-Hyun SHIN³

1: Samsung Electronics Company, Republic of Korea

2: Chungnam National University, Republic of Korea

3: Sogang University, Republic of Korea

10:00 - 10:20 DVM-04

SELF-POWERED SEEK-INDUCED KINETIC ENERGY HARVESTER IN COMPUTER HARD DISK DRIVES

Jen-Yuan (James) CHANG

Massey University, New Zealand

10:20 - 10:40 DVM-05

NEWLY DESIGNED SLIDER-BASED MICRO-ACTUATOR FOR MAGNETIC DISK DRIVE

Yusuke NOJIMA, Shinji KOGANEZAWA

Fujitsu Limited, Japan

(10:40 – 11:00 BREAK)

6 / 19 Room 1 (201A)

Drive Mechanisms II (11:00 – 12:20)

Chair: #####

11:00 - 11:20 DVM-06

AN OPTIMIZED DESIGN USING THE VCM YOKE TO SUPPORT THE ACTUATOR PIVOT

Takeshi YOSHIDA¹, Shinobu YOSHIDA²

1: Hitachi Information Academy Co., Ltd., Japan

2: Hitachi Ltd., Japan

11:20 - 11:40 DVM-07

SHOCK RESPONSE OF DISK, MOTOR-BASE AND TOP-COVER IN HDD

Xiao Cong YAO, Xue Chao WANG, Jun Yan YANG, Da Peng ZHAO

SAE Magnetics (H.K.) Ltd., China

11:40 - 12:00 DVM-08

SHOCK RESPONSE IN DROP TEST SIMULATION OF A SMALL FORM FACTOR DISK DRIVE

Bin GU¹, Dong-Wei SHU¹, Bao-Jun SHI²

1: Nanyang Technological University, Singapore

2: Shandong Jianzhu University, China

12:00 - 12:20 DVM-09

VALIDATION OF SOLID STATE DRIVES - VIRTUAL PORT EMULATION

Alok PANDEY

Intel, India

(12:20 – 13:50 LUNCH)

13:50 – 18:00 WORKSHOP AT CONVENTION HALL 300

(18:00 – 18:30 PHOTOGRAPHY AT ENTRANCE HALL)

(18:30 – 20:30 BANQUET AT MULTI-PURPOSE HALL)

6 / 19
Room 2 (201B)

6 / 19 Room 2 (201B)

Micro/Nanosystem Science and Technology III (9:00 – 10:40)

Chair: Dr. Masaharu KURODA (National Institute of Advanced Industrial Science and Technology, Japan)

9:00 - 9:20 MNS-09

INSECT-INSPIRED WALL-CLIMBING ROBOTS MICRO UTILIZING SURFACE TENSION FORCES

Kenji SUZUKI, Shusuke NEMOTO, Takahiro FUKUDA, Hideaki TAKANOBU, Hirofumi MIURA
Kogakuin University, Japan

9:20 - 9:40 MNS-10

ELECTROWETTING-BASED ACTUATION OF LIQUID DROPLETS FOR MICRO
TRANSPORTATION SYSTEMS

Kenji SUZUKI, Hiroaki HOMMA, Tatsuya MURAYAMA, Hideaki TAKANOBU, Hirofumi MIURA
Kogakuin University, Japan

9:40 - 10:00 MNS-11

DESIGN OF ELECTRO HYDRO DYNAMICS (EHD) MICRO PUMP TO GENERATE OSCILLATING
FLOW AT LOW FREQUENCY

Yuhei FUJIWARA, Ichiro KANO, Ichiro TAKAHASHI
Yamagata University, Japan

10:00 - 10:20 MNS-12

DEVELOPMENT OF PNEUMATIC SERVO BEARING ACTUATOR FOR NANO-POSITIONING

Katto SATOSHI¹, Masato KADOTANI¹, Takakazu KITAGAWA¹, Tomoko HIRAYAMA¹,
Takashi MATSUOKA¹, Katsumi SASAKI²
1: Doshisha University, Japan
2: Pneumatic Servo Controls Ltd., Japan

10:20 - 10:40 MNS-13

ACTIVE DAMPING OF MICRO-ACTUATOR FOR HDD TRACKING SERVO

Toshiki HIRANO
Hitachi Global Storage Technologies San Jose Research Center, USA

(10:40 - 11:00 BREAK)

6 / 19 Room 2 (201B)

Micro/Nanosystem Science and Technology IV (11:00 – 12:20)

Chair: Prof. Tomoko HIRAYAMA (Doshisha University, Japan)

11:00 - 11:40 MNS-K **Keynote Address**

TRIBOLOGICAL PROPERTIES OF SELF-ASSEMBLED MOLECULAR LAYERS

Miki NAKANO
National Institute of Advanced Industrial Science and Technology (AIST), Japan

11:40 - 12:00 MNS-14

NANO-STRUCTURE-BASED PATTERNING OF NANOMETER THICK LUBRICANT FILMS

Kenji FUKUZAWA, Yusuke SHIKATA, Yuichi IMURA, Shintaro ITOH, Hedong ZHANG
Nagoya University, Japan

12:00 - 12:20 MNS-15

NANOSCALE FRICTION BEHAVIORS OF HIERARCHICAL SUPERHYDROPHOBIC STRUCTURE
OF DIAMOND LIKE CARBON FILMS WITH VARIOUS HUMIDITY CONDITIONS

Young-Jun JANG, Hiroyuki KOUSAKA, Noritsugu UMEHARA
Nagoya University, Japan

(12:20 – 13:50 LUNCH)

13:50 – 18:00 WORKSHOP AT CONVENTION HALL 300

(18:00 – 18:30 PHOTOGRAPHY AT ENTRANCE HALL)

(18:30 – 20:30 BANQUET AT MULTI-PURPOSE HALL)

6 / 19
Room 3 (202A)

6 / 19 Room 3 (202A)

MM/Micro/Nano Precision Equipments I (9:00 – 10:20)

Chair: Prof. Mikio HORIE (Tokyo Institute of Technology, Japan)

9:00 - 9:40 PRE-K **Keynote Address**

APPLICATION OF MICRO-NANO TECHNOLOGIES FOR OPTICAL AND BIOLOGICAL FIELDS

Fumikazu OOHIRA, Takaaki SUZUKI
Kagawa University, Japan

9:40 - 10:00 PRE-01

PRACTICAL COMMON DESIGN PROCEDURE OF PRECISION POSITIONING CONTROLLER FOR NON-CONTACT AND CONTACT MECHANISMS

Shin Horng CHONG, Kaiji SATO
Tokyo Institute of Technology, Japan

10:00 - 10:20 PRE-02

ACTIVE VIBRATION SUPPRESSION USING EFFICIENT AND ROBUST PZT-ACTUATED SUSPENSION

Landong MARTUA, Yopie ADRIANTO, Yin Quan YU, Wu Zhong LIN, Eng Hong ONG
Data Storage Institute, Singapore

(10:20 – 11:00 BREAK)

6 / 19 Room 3 (202A)

MM/Micro/Nano Precision Equipments II (11:00 – 12:20)

Chair: Prof. Seiichi HATA (Tokyo Institute of Technology, Japan)

11:00 - 11:20 PRE-03

MAGNETIC ACTUATION TYPE LOW COST POLYMER MEMS MIRROR FABRICATED BY PHOTOLITHOGRAPHY TECHNOLOGY

Tetsuro NAKANO¹, Takaaki SUZUKI¹, Fumikazu OOHIRA¹, Gen HASHIGUTI²
1: Kagawa University, Japan
2: Shizuoka University, Japan

11:20 - 11:40 PRE-04

DRIVING CHARACTERISTIC OF AN OPTICAL MEMS SWITCH USING A BELT-SHAPED THIN FILM MIRROR AND A HIGH DIELECTRIC CONSTANT LAYER

Kazutoshi OKUTSU, Masahiko NISHIMURA, Kaiji SATO
Tokyo Institute of Technology, Japan

11:40 - 12:00 PRE-05

IMPULSE-DRIVEN SMALL CAPSULE FOR MEDICAL TREATMENT

Takahiro ITO¹, Shuhei ISHIMORI¹, Teru HAYASHI²
1: Kyushu Institute of Technology, Japan
2: Ogasawara Precision Laboratory, Japan

12:00 - 12:20 PRE-06

NEW SURFACE MOUNT SYSTEM COMPOSED OF PLASTIC MINIATURE PANTOGRAPH
MECHANISMS AND A POSITIONING TABLE

Yohei KAI¹, Daiki KAMIYA², Mikio HORIE², Yuichi NAKAZATO³

- 1: Tokyo Institute of Technology, Interdisciplinary Graduate School, Japan
- 2: Tokyo Institute of Technology, Precision and Intelligence Laboratory, Japan
- 3: Nippon Institute of Technology, Japan

(12:20 – 13:50 LUNCH)

13:50 – 18:00 WORKSHOP AT CONVENTION HALL 300

(18:00 – 18:30 PHOTOGRAPHY AT ENTRANCE HALL)

(18:30 – 20:30 BANQUET AT MULTI-PURPOSE HALL)

6 / 19
Room 4 (202B)

6 / 19 Room 4 (202B)

Bio-medical Equipments I (9:00 – 10:40)

Chair: Prof. Mami TANAKA (Tohoku University, Japan)

9:00 - 9:40 BIO-K **Keynote Address**

MR-SAFE SURGICAL DEVICES FOR ACCURATE IMAGE GUIDED SURGERY

Ken MASAMUNE, Ikuma SATO, Hiromasa YAMASHITA, Takeyoshi DOHI
The University of Tokyo, Japan

9:40 - 10:00 BIO-01

RADIAL HYDRAULIC FORCE ESTIMATION IN A MAGNETICALLY LEVITATED CENTRIFUGAL BLOOD PUMP

Chi Nan PAI¹, Tadahiko SHINSHI², Xiaoyou ZHANG², Akira SHIMOKOHBE²

- 1: Tokyo Institute of Technology, Interdisciplinary Graduate School of Science and Engineering, Japan
- 2: Tokyo Institute of Technology, Precision and Intelligence Laboratory, Japan

10:00 - 10:20 BIO-02

ROTARY DNA-CHIP SCANNER BASED ON A DVD OPTICAL PICK-UP

Sookyung KIM¹, Wonhyung CHO¹, Ki Seong SEO¹, Sangbin LEE¹, Kyung-Ho KIM², Seung-Yop LEE²

- 1: Nanostorage Inc., Republic of Korea
- 2: Sogang University, Republic of Korea

10:20 - 10:40 BIO-03

DESIGN AND CONTROL OF A MAGNETICALLY DRIVEN CAPSULE-ROBOT FOR ENDOSCOPY

Saman HOSSEINI, Mir Behrad KHAMESEE,
University of Waterloo, Canada

(10:40 – 11:00 BREAK)

6 / 19 Room 4 (202B)

Bio-medical Equipments II (11:00 – 12:20)

Chair: Assis. Prof. Takeshi OKUYAMA (Tohoku University, Japan)

11:00 - 11:20 BIO-04

WEARABLE EATING HABIT SENSING USING SOUND INFORMATION

Masaki SHUZO^{1,4}, Shintaro KOMORI¹, Tomoko TAKASHIMA^{1,4}, Guillaume LOPEZ^{1,4}, Seiji TATSUTA^{2,4},
Shintaro YANAGIMOTO^{3,4}, Shinichi WARISAWA^{1,4}, Jean-Jacques DELAUNAY^{1,4}, Ichiro YAMADA^{1,4}

- 1: The University of Tokyo, Japan
- 2: Olympus Corporation, Japan
- 3: The University of Tokyo Hospital, Japan
- 4: Japan Science and Technology Agency, CREST, Japan

11:20 - 11:40 BIO-05

CONTINUOUS BLOOD PRESSURE MONITORING IN DAILY LIFE

Guillaume LOPEZ^{1,4}, Masaki SHUZO^{1,4}, Hiroyuki USHIDA¹, Keita HIDAKA¹, Shintaro YANAGIMOTO^{2,4},
Yasushi IMAI^{2,4}, Akio KOSAKA^{3,4}, Jean-Jacques DELAUNAY^{1,4}, Ichiro YAMADA^{1,4}

- 1: The University of Tokyo, Japan
- 2: The University of Tokyo Hospital, Japan
- 3: Olympus Corporation, Japan
- 4: Japan Science and Technology Agency, CREST, Japan

11:40 - 12:00 BIO-06

A HANDY INSTRUMENT FOR QUANTITATIVE EVALUATION OF KINEMATICAL PATELLAR TENDON REFLEX RESPONSES

Yasuaki OHTAKI¹, Naotaka MAMIZUKA², Mohammad A. FARD³, Yoshinori HARADA⁴, Naoyuki OCHIAI⁴

- 1: University of Yamanashi, Japan
- 2: Mito General Hospital, Japan
- 3: Royal Melbourne Institute of Technology, Australia
- 4: University of Tsukuba, Japan

12:00 - 12:20 BIO-07

3D MEASUREMENT OF FOREARM AND UPPER ARM DURING THROWING MOTION USING BODY MOUNTED SENSOR

Hideharu KODA¹, Koichi SAGAWA¹, Kouta KUROSHIMA¹, Toshiaki TSUKAMOTO², Kazutaka URITA², Yasuyuki ISHIBASHI³

- 1: Hirosaki University, Graduate School of Science and Technology, Japan
- 2: Hirosaki University, School of Medicine & Hospital, Japan
- 3: Hirosaki University, School of Medicine, Japan

(12:20 – 13:50 LUNCH)

13:50 – 18:00 WORKSHOP AT CONVENTION HALL 300

(18:00 – 18:30 PHOTOGRAPHY AT ENTRANCE HALL)

(18:30 – 20:30 BANQUET AT MULTI-PURPOSE HALL)

6 / 20
Room 1 (201A)

6 / 20 Room 1 (201A)

Drive Mechanisms III (9:40 – 10:40)

Chairs: #####

9:40 - 10:00 DVM-10

HDD FLEX CABLE VIBRATIONS CONSIDERING BOUNDARY GEOMETRICAL TOLERANCES

Jen-Yuan (James) CHANG

Massey University, New Zealand

10:00 - 10:20 DVM-11

NUMERICAL SIMULATION OF PARTICLE BEHAVIOR IN HARD DISK DRIVES

Taisuke SUGII, Yukinobu ABE, Hiroshi MUKAI, Masato Ikegawa, Masatoshi WATANABE

Hitachi Ltd., Japan

10:20 - 10:40 DVM-12

CRITICAL ISSUES IN VIBRATION TESTING OF HARD DISK DRIVE SPINDLE MOTORS AT ELEVATED TEMPERATURES

Tsung-Liang WU¹, I-Yeu SHEN², Fusatoshi OKAMOTO³, Takafumi ASADA³

1: Industrial Technology Research Institute, Taiwan

2: University of Washington, USA

3: Panasonic Shikoku Electronics Co., Ltd., Japan

(10:40 – 11:00 BREAK)

6 / 20 Room 1 (201A)

Drive Mechanisms IV (11:00 – 12:20)

Chairs: #####

11:00 - 11:20 DVM-13

EMPIRICAL ANALYSIS ON FREQUENCY DEPENDENCY OF AIRFLOW EXCITATION FOR DISK FLUTTER OF HARD DISK DRIVE

Takehiko EGUCHI

Hitachi Ltd., Japan

11:20 - 11:40 DVM-14

AIRFLOW INDUCED VIBRO-ACOUSTICS ANALYSIS OF HDD

Wu Zhong LIN, Feng GAO, Eng Hong ONG

Data Storage Institute, Singapore

11:40 - 12:00 DVM-15

FLOW-INDUCED VIBRATION REDUCTION OF HARD DISK DRIVE WITH A WINDOW SPOILER

Masato Ikegawa, Hiroshi MUKAI

Hitachi Ltd., Japan

12:00 - 12:20 DVM-16

THERMAL ANALYSIS OF HELIUM-FILLED ENTERPRISE DISK DRIVE

Jiaping YANG, Cheng Peng Henry TAN, Jianqiang MOU, Eng Hong ONG

Data Storage Institute, Singapore

(12:20 – 13:50 LUNCH)

6/20 Room 1 (201A)

Imaging and Printing Technologies I (13:50 – 14:30)

Chair: Prof. George T.-C. Chiu (School of Mechanical Engineering, Purdue University, USA)

13:50 - 14:10 IMG-01

DEVELOPMENT OF NEW NOZZLE FOR CONTINUOUS INKJET PRINTERS

Mamoru OKANO¹, Tomohiro INOUE¹, Yoshiharu TAKIZAWA², Tadayuki MATSUDA²

1: Hitachi Ltd., Japan

2: Hitachi Industrial Equipment Systems Co., Ltd., Japan

14:10 - 14:30 IMG-02

FUNDAMENTAL CHARACTERISTICS OF GELATIN PATTERNING UTILIZING ELECTROSTATIC INJECTION

Shinjiro UMEZU¹, Hitoshi OHMORI²

1: Tokai University, Japan

2: Riken, Japan

(14:30 – 14:50 BREAK)

6/20 Room 1 (201A)

Imaging and Printing Technologies II (14:50 – 16:10)

Chair: Dr. Shinjiro UmezU (Tokai University, Japan)

14:50 - 15:10 IMG-03

ELECTROSTATIC INKJET FOR MICRO-FILM FORMATION BY SPRAYING VISCOUS LIQUID

Kazuyuki TADA, Masato NISHIURA, Noritaka HARA, Kiyohito MARUO, Nozomi YOSHIDA,

Hiroyuki KAWAMOTO

Waseda University, Japan

15:10 - 15:30 IMG-04

HIGH SCALABLE PARALLEL ALGORITHM FOR DISCRETE ELEMENT METHOD

Tomohiro SEKO, Toshiroh SHIMADA, Nobuyuki NAKAYAMA

Fuji Xerox Co., Ltd., Japan

15:30 - 15:50 IMG-05

VELOCITY COMMAND SYNTHESIS BASED ON COMMAND SHAPING AND ITERATIVE LEARNING CONTROL FOR REDUCING VIBRATIONS AND COLOR MISREGISTRATION IN DOCUMENT SCANNERS

Moeed MUKHTAR, George T.-C. CHIU

Purdue University, USA

15:50 - 16:10 IMG-06

DEVELOPMENT OF AN ELECTROPHOTOGRAPHIC LASER INTENSITY MODULATION MODEL FOR EXTRINSIC SIGNATURE EMBEDDING

Pei-Ju CHIANG¹, George T.-C. CHIU¹, Edward J. DELP², Jan P. ALLEBACH²

1: Purdue University, School of Mechanical Engineering, USA

2: Purdue University, School of Electrical and Computer Engineering, USA

6 / 20
Room 2 (201B)

6 / 20 Room 2 (201B)

Simulations of Micro/Nano Scale Phenomena I (9:00 – 10:40)

Chair: Prof. Kenji FUKUZAWA (Nagoya University, Japan)

9:00 - 9:40 SIM-K **Keynote Address**

EXPECTATIONS FOR SIMULATION TECHNOLOGIES TO INTELLECTUAL DESIGN OF PRODUCTS

Naoya SASAKI
Hitachi Ltd., Japan

9:40 - 10:00 SIM-01

MD SIMULATION ON THE RESPONSE SPEED OF HYDRAULIC FLUID

Toshiyuki TSUBOUCHI¹, Hiroshi SETOGAWA², Ugur MART², Ai SUZUKI³, Hideyuki TSUBOI²,
Nozomu HATAKEYAMA², Akira ENDOU², Hiromitsu TAKABA⁴, Carlos A. del CARPIO²,
Akira MIYAMOTO^{3,4,2}

- 1: Idemitsu Kosan Co. Ltd., Japan
- 2: Tohoku University, Graduate School of Engineering, Department of Applied Chemistry, Japan
- 3: Tohoku University, New Industry Creation Hatchery Center, Japan
- 4: Tohoku University, Graduate School of Engineering, Department of Chemical Engineering, Japan

10:00 - 10:20 SIM-02

FRICTION ANALYSIS OF COATINGS BY PARTICLE METHOD

Yasuhiro HIKITA¹, Takahisa KATO²
1: Taiho Kogyo Co., Ltd., Japan
2: The University of Tokyo, Japan

10:20 - 10:40 SIM-03

MULTI-SCALE SPATIAL MODEL FOR MULTI-SCALE PRODUCT DESIGN AND SIMULATION SYSTEM IMPLEMENTED WITH MESSAGE PASSING INTERFACE

Kazuhiro SAKITA
Japan

(10:40 - 11:00 BREAK)

6 / 20 Room 2 (201B)

Simulations of Micro/Nano Scale Phenomena II (11:00 – 12:20)

Chair: Prof. Kentaro TANAKA (Tokyo University of Marine Science and Technology, Japan)

11:00 - 11:20 SIM-04

MOLECULAR DYNAMICS STUDY OF EXTRAORDINARY ELASTIC DEFORMATION FOUND IN GOLD ATOMIC CLUSTER

Ken-ichi SAITOH, Yoshiaki YONEKAWA
Kansai University, Japan

11:20 - 11:40 SIM-05

MECHANISM OF SUPERLUBRICITY OF FULLERENE BEARINGS

Naruo SASAKI¹, Noriaki ITAMURA¹, Kouji MIURA²
1: Seikei University, Japan
2: Aichi University of Education, Japan

11:40 - 12:00 SIM-06

ON THE STABILITY OF THE STATE OF SUPERLUBRICITY

Motohisa HIRANO, Takahiro NITTA, Hirotaka KATO
Gifu University, Japan

12:00 - 12:20 SIM-07

MICROSCOPIC MECHANISM FOR KINETIC FRICTION: ENERGY DISSIPATION DUE TO LATTICE VIBRATION IN SLIDING SURFACES

Seiji KAJITA, Hitoshi WASHIZU, Toshihide OHMORI
Toyota Central R&D Labs., Inc., Japan

(12:20 – 13:50 LUNCH)

6 / 20 Room 2 (201B)

Simulations of Micro/Nano Scale Phenomena III (13:50 – 15:10)

Chair: Dr. Toshiyuki TSUBOUCHI (Idemitsu Kosan Co. Ltd., Japan)

13:50 - 14:10 SIM-08

DYNAMIC STRUCTURE OF BOUNDARY LUBRICATING WATER FILM ON HYDROPHILIC SURFACES USING MOLECULAR DYNAMICS SIMULATION

Hitoshi WASHIZU¹, Seiji KAJITA¹, Shi-aki HYODO¹, Toshihide OHMORI¹, Hiroshi TERANISHI²,
Atsushi SUZUKI²

- 1: Toyota Central R&D Labs., Inc., Japan
- 2: Toyota Motor Corp., Japan

14:10 - 14:30 SIM-09

MOLECULAR DYNAMICS SIMULATIONS OF UV PATTERNING OF MONOLAYER LIQUID LUBRICANT FILMS

Hedong ZHANG¹, Shinji KOMATSU¹, Kenji FUKUZAWA², Shintaro ITOH²

- 1: Nagoya University, Graduate School of Information Science, Japan
- 2: Nagoya University, Graduate School of Engineering, Japan

14:30 - 14:50 SIM-10

DYNAMIC CONTACT ANGLE AND GROWTH OF A MENISCUS BRIDGE USING PARTICLE BASED NUMERICAL SIMULATION

Kentaro TANAKA, Fumihiko ASAMI, Katsumi IWAMOTO
Tokyo University of Marine Science and Technology, Japan

14:50 - 15:10 SIM-11

A NEW APPROACH ON CALCULATION OF VISCOSITIES OF COMPLEX LIQUIDS USING ULTRA-ACCELERATED QUANTUM CHEMICAL MOLECULAR DYNAMICS

Ugur MART^{1,4}, Hideyuki TSUBOI¹, Nozomu HATAKEYAMA¹, Akira ENDOU¹,
Hiromitsu TAKABA¹, Carlos A. del CARPIO¹, Toshiyuki TSUBOUCHI³, Akira MIYAMOTO^{1,2}

- 1: Tohoku University, Department of Applied Chemistry, Japan
- 2: Tohoku University, New Industry Creation Hatchery Center, Japan
- 3: Idemitsu Kosan Co. Ltd., Japan
- 4: University of Southampton, UK

(15:10 – 15:30 BREAK)

6 / 20 Room 2 (201B)

Simulations of Micro/Nano Scale Phenomena IV (15:30 – 16:30)

Chair: Dr. Hitoshi WASHIZU (Toyota Central R&D Labs. Inc., Japan)

15:30 - 15:50 SIM-12

MOLECULAR DYNAMICS SIMULATIONS OF ADHESION PROPERTIES OF MONOLAYER LIQUID LUBRICANT FILMS

Hedong ZHANG¹, Shinji KOMATSU¹, Kenji FUKUZAWA², Shintaro ITOH²

1: Nagoya University, Graduate School of Information Science, Japan

2: Nagoya University, Graduate School of Engineering, Japan

15:50 - 16:10 SIM-13

SIMULATION OF PICO-FORCE DETECTION IN LATERAL-MODE DYNAMIC AFM

Naruo SASAKI¹, Shigeki KAWAI^{2,3}, Hideki KAWAKATSU²

1: Seikei University, Japan

2: University of Tokyo and JST-CREST, Japan

3: University of Basel, Switzerland

16:10 - 16:30 SIM-14

MOLECULAR DYNAMICS STUDY ON NANOINDENTATION OF SINGLE-CRYSTALLINE ALUMINA THIN FILM

Kenji NISHIMURA¹, Aiichiro NAKANO²

1: National Institute of Advanced Industrial Science and Technology (AIST), Japan

2: University of Southern California, USA

6 / 20
Room 3 (202A)

6 / 20 Room 3 (202A)

MM/Micro/Nano Precision Equipments III (9:40 – 10:40)

Chair: Prof. Kaiji SATO (Tokyo Institute of Technology, Japan)

9:40 - 10:00 PRE-07

MECHANICAL DESIGN OF LARGE-APERTURE DISK AMPLIFIERS FOR A HIGH-POWER SOLID-STATE LASER

Hai ZHOU¹, Shaobo HE¹, Yuanbin CHEN¹, Donghui LIN¹, Taiqin CHA², Na XIE¹, Liangming CHEN¹

1: Chinese Academy of Engineering Physics, Research Center of Laser Fusion, China

2: Chengdu Aircraft Industrial (Group) Co., Ltd., China

10:00 - 10:20 PRE-08

DEVELOPMENT OF THE PRECISION ADJUSTMENT SYSTEM FOR LARGE-APERTURE MOSAIC GRATINGS

Donghui LIN¹, Xiao WANG¹, Rui REN¹, Na XIE¹, Hai ZHOU¹, Qihua ZHU¹, Shengqiang FAN²

1: Chinese Academy of Engineering Physics, Research Center of Laser Fusion, China

2: Chengdu Ke Xin Da Corporation, Ltd., China

10:20 - 10:40 PRE-09

ACCURATE RUNOUT MEASUREMENT FOR HDDS

Quan JIANG, Chao BI, Song LIN

Data Storage Institute, Singapore

(10:40 – 11:00 BREAK)

6 / 20 Room 3 (202A)

MM/Micro/Nano Precision Equipments IV (11:00 – 12:20)

Chair: Prof. Tadahiko SHINSHI (Tokyo Institute of Technology, Japan)

11:00 - 11:20 PRE-10

DESIGN AND FABRICATION ON A NOVEL TRAVELING WAVE TYPE CYLINDRICAL ULTRASONIC LINEAR MICROACTUATOR

Dongming SUN¹, Sheng WANG¹, Seiichi HATA¹, Junpei SAKURAI¹, Akira SHIMOKOHBE²

1: Tokyo Institute of Technology, Precision and Intelligence Laboratory, Japan

2: Tokyo Institute of Technology, Emeritus professor, Japan

11:20 - 11:40 PRE-11

STUDY ON GYROSCOPIC POWER GENERATOR -2nd REPORT
IMPEDANCE CONTROL FOR STABLE OPERATION

Jun IWASAKI, Satoru YOSHIKAWA, Hiroshi HOSAKA, Ken SASAKI

The University of Tokyo, Japan

11:40 - 12:00 PRE-12

2D NANO-MOTION ACTUATOR FOR PRECISE TRACK FOLLOW

Shigeki MORI¹, Yuudai SATO², Akira SAKURADA¹, Akihiro NAGANAWA², Yotsugi SHIBUYA², Goro OBINATA³

1: Akita Research Institute of Advance Technology, Japan

2: Akita University, Japan

3: Nagoya University, Japan

12:00 - 12:20 PRE-13

STUDY ON GYROSCOPIC POWER GENERATOR -1st REPORT
PROTOTYPE AND ITS FUNDAMENTAL CHARACTERISTICS

Manabu KASAHARA, Hiroshi YOSHIDA, Hiroshi HOSAKA, Ken SASAKI
The University of Tokyo, Japan

(12:20 – 13:50 LUNCH)

6 / 20 Room 3 (202A)

Optical Storage / Optical Devices for Storage I (13:50 – 15:10)

Chair: Prof. Toshifumi OHKUBO (Toyo University, Japan)

13:50 - 14:30 OPT-K **Keynote Address**

INTEGRATED OPTICAL SYSTEM FOR THERMALLY ASSISTED MAGNETIC RECORDING
-TOWARD TERABIT-CLASS HDD

Takuya MATSUMOTO¹, Junichiro SHIMIZU¹, Irizo NANIWA¹, Yasuhiko IWANABE¹, Satoshi ARAI²,
Toshio TAKAHASHI², Shigeyuki SASAKI³, Shigeo NAKAMURA³, Fumiko AKAGI¹, Harukazu MIYAMOTO¹

1: Hitachi Ltd., Central Research Laboratory, Japan

2: Hitachi Ltd., Production Engineering Research Laboratory, Japan

3: Hitachi Ltd., Mechanical Engineering Research Laboratory, Japan

14:30 - 14:50 OPT-01

IN-PLANE ERROR SIGNAL DETECTION BY DIFFERENTIAL PUSH-PULL METHOD FOR OPTICAL
RECORDING MEDIUM HAVING 2-DIMENSIONAL PERIODIC STRUCTURE

Mizuho TOMIYAMA, Ryuichi KATAYAMA
NEC Corporation, Japan

14:50 - 15:10 OPT-02

CONTROLLING DEPTH OF FIELD OF IMAGING SYSTEM USING CODED APERTURE

Sang-Hyuck LEE¹, No-Cheol PARK², Young-Pil PARK², Kyoung-Su PARK¹

1: Yonsei University, Center for Information Storage Device, Republic of Korea

2: Yonsei University, Department of Mechanical Engineering, Republic of Korea

(15:10 – 15:30 BREAK)

6 / 20 Room 3 (202A)

Optical Storage / Optical Devices for Storage II (15:30 – 16:50)

Chairs: Dr. Shigeo NAKAMURA (Hitachi Ltd., Japan)

15:30 - 15:50 OPT-03

TILT AND SERVO CONTROL BY INTELLIGENCE ALGORITHM IN HOLOGRAPHIC DATA
STORAGE SYSTEM

Jang Hyun KIM, Hyun-Seok YANG, Jin Bae PARK, Yong-pil PARK
Yonsei University, Republic of Korea

15:50 - 16:10 OPT-04

IMPROVED ANTI-SHOCK AIR GAP CONTROL USING QUADRANT Q FILTER AND DEAD-ZONE
NONLINEAR CONTROLLER FOR SIL-BASED NEAR-FIELD STORAGE SYSTEM

Jung-Gon KIM¹, Won-Ho SHIN², Hyun-Woo Hwang², Kyoung-Su PARK², No-Cheol PARK²,
Hyun-Seok YANG², Young-Pil PARK²

1: Yonsei University, Center for Information Storage Device, Republic of Korea

2: Yonsei University, Department of Mechanical Engineering, Republic of Korea

16:10 - 16:30 OPT-05

HIGH RESOLUTION SOLID IMMERSION LENS-BASED NEAR-FIELD OPTICS WITH AN ANNULAR APERTURE

Yong-Joong YOON¹, Wan-Chin KIM¹, Hyungbae MOON¹, No-Cheol PARK², Young-Pil PARK²,
Kyoung-Su PARK²

1: Yonsei University, Center for Information Storage Device, Republic of Korea

2: Yonsei University, Department of Mechanical Engineering, Republic of Korea

16:30 - 16:50 OPT-06

FEASIBILITY ANALYSIS IN THE APPLICATION OF RADially POLARIZATION TO NEAR-FIELD OPTICAL MICROSCOPY

Yong-Joong YOON¹, Wan-Chin KIM¹, Tae Seob KIM², No-Cheol PARK², Young-Pil PARK², Kyoung-Su PARK²

1: Yonsei University, Center for Information Storage Device, Republic of Korea

2: Yonsei University, Department of Mechanical Engineering, Republic of Korea

6 / 20

Room 4 (202B)

6 / 20 Room 4 (202B)

Bio-medical Equipments III (9:00 – 10:40)

Chair: Prof. Koichi SAGAWA (Hirosaki University, Japan)

9:00 - 9:20 BIO-08

DEVELOPMENT OF A HAPTIC SENSOR FOR MONITORING HUMAN SKIN
CONDITIONS: MEASUREMENT OF SOFTNESS, SMOOTHNESS, AND TACKINESS

Daisuke TSUCHIMI¹, Takeshi OKUYAMA², Mami TANAKA¹

- 1: Tohoku University, Graduate School of Biomedical Engineering, Japan
- 2: Tohoku University, Graduate School of Engineering, Japan

9:20 - 9:40 BIO-09

EXPANSION OF BALLOON ON SOFT OBJECT AND ITS APPLICATION TO TACTILE SENSOR

Yoshihiro TANAKA, Kazuki DOUMOTO, Akihito SANO, Hideo FUJIMOTO

Nagoya Institute of Technology, Japan

9:40 - 10:00 BIO-10

DEVELOPMENT OF A CURVATURE SENSOR USING A SOLID POLYMER ELECTROLYTE

Takeshi OKUYAMA¹, Manabu OTSUKI², Ryota KOMIYA³, Nozomu SUGOH³, Mami TANAKA²

- 1: Tohoku University, Graduate School of Engineering, Japan
- 2: Tohoku University, Graduate School of Biomedical Engineering, Japan
- 3: Kuraray Co., Ltd., Japan

10:00 - 10:20 BIO-11

A BODY MOTION INSTRUCTION SYSTEM USING SHAPE MEMORY ALLOY ACTUATOR

Ryota SAKAMOTO¹, Kohei TAKAGI¹, Tokuhiro SUGIURA², Yoshihiko NOMURA³

- 1: Mie University, Graduate school of Engineering, Japan
- 2: Mie University, Center for Information Technologies and Networks, Japan
- 3: Mie University, Japan

10:20 - 10:40 BIO-12

SENSORY FEEDBACK OF AN INTELLIGENT ARTIFICIAL ARM

Kazuo KIGUCHI, Hiroshi SATO, Junichi KARIYA

Saga University, Japan

(10:40 – 11:00 BREAK)

6 / 20 Room 4 (202B)

Micro/Nanomechatronics I (11:00 – 12:20)

Chair: Prof. Hirofumi SHINTAKU (Osaka University, Japan)

11:00 - 11:40 MCH-K **Keynote Address**

BIONANOTECHNOLOGY FOR THE MEASUREMENT, MODIFICATION AND UTILIZATION OF
CELLULAR FUNCTIONS

Masao WASHIZU

The University of Tokyo, Japan

11:40 - 12:00 MCH-01

DEVELOPMENT OF A NOVEL METHOD FOR STRETCHING DNA FIBERS ON MICROBRIDGES
FABRICATED BY SINGLE-MASK INCLINED UV LITHOGRAPHY

Daisuke HIRAMARU¹, Takaaki SUZUKI², Ariko FUKU¹, Hiroyuki SUZUKI², Isaku KANNO¹,
Hidetoshi KOTERA¹

- 1: Kyoto University, Japan
- 2: Kagawa University, Japan

12:00 - 12:20 MCH-02

DEVELOPMENT OF A TISSUE-LIKE CHIP TO EXCLUSIVELY STIMULATE SINGLE CELL AND DETECT ITS PHYSIOLOGICAL REACTION

Atsuhito OKONOGI^{1,2}, Kyohei TERAOKA⁴, Teru OKITSU³, Takaaki SUZUKI⁴, Hidetoshi KOTERA²

- 1: JST CREST, Japan
- 2: Kyoto University, Japan
- 3: Kyoto University Hospital, Japan
- 4: Kagawa University, Japan

(12:20 – 14:10 LUNCH)

6 / 20 Room 4 (202B)

Micro/Nanomechatronics II (14:10 – 15:10)

Chair: Prof. Hidetoshi KOTERA (Kyoto University, Japan)

14:10 - 14:30 MCH-03

SHAPE MEMORY PIEZOELECTRIC ACTUATOR WITH ASYMMETRIC VOLTAGE OPERATION

Yoichi KADOTA, Hiroshi HOSAKA, Takeshi MORITA

The University of Tokyo, Japan

14:30 - 14:50 MCH-04

EFFECT OF AC DRIVE IN CONTROL OF MEMS MIRROR TILT ANGLE

Naru NEMOTO, Joji YAMAGUCHI, Fusao SHIMOKAWA

Nippon Telegraph and Telephone Corp., Japan

14:50 - 15:10 MCH-05

CHARACTERISTICS OF RESONANT MICRO MIRROR IN VACUUM

Chu Hoang MANH, Kazuhiro HANE

Tohoku University, Japan

(15:10 – 15:30 BREAK)

6 / 20 Room 4 (202B)

Micro/Nanomechatronics III (15:30 – 16:50)

Chair: Prof. Takaaki SUZUKI (Kagawa University, Japan)

15:30 - 15:50 MCH-06

POSITIONING CONTROL OF A CANTILEVER TYPE MICROACTUATOR USING HIGH-PERFORMANCE NdFeB/Ta THIN FILM MAGNET AND BUILT-IN DISPLACEMENT SENSOR

Sen YAO¹, Shunji GOTO¹, Ryo TANABE¹, Tadahiko SHINSHI¹, Minoru UEHARA², Hitoshi YAMAMOTO²

- 1: Tokyo Institute of Technology, Japan
- 2: Hitachi Metals Ltd., Japan

15:50 - 16:10 MCH-07

IMPROVEMENT OF SELF-SENSING PIEZOELECTRIC ACTUATOR CONTROL USING PERMITTIVITY CHANGE DETECTION

Yusuke ISHIKIRIYAMA, Takeshi MORITA

The University of Tokyo, Japan

16:10 - 16:30 MCH-08

AN ADAPTIVE MECHANICAL RESONATOR FOR WIDEBAND VIBRATION ENERGY HARVESTING

Hiroshi OKAMOTO, Yuichiro HAMATE, Hiroki KUWANO

Tohoku University, Japan

16:30 - 16:50 MCH-09

MICROFABRICATED ACOUSTIC SENSOR WITH FREQUENCY SELECTIVITY AND ELECTRIC SIGNAL CONVERSION FOR NOVEL ARTIFICIAL COCHLEAR SYSTEM

Hirofumi SHINTAKU¹, Takayuki NAKAGAWA², Toshiya KANBE¹, Harto TANUJAYA¹, Satoyuki KAWANO¹, Juichi ITO²

1: Osaka University, Japan

2: Kyoto University, Japan

(16:50 – 17:10 BREAK)

6 / 20 Room 4 (202B)

Micro/Nanomechatronics IV (17:10 – 18:10)

Chair: Prof. Kyohei TERAO (Kagawa University, Japan)

17:10 - 17:30 MCH-10

HANDLING CHARACTERISTICS OF MEMS-TWEEZERS WITH CONTACT SURFACE FABRICATED BY ICP DRY-ETCHING

Satomitsu IMAI, Tadashi ISHIKAWA, Masakazu SATO, Hiroki SATO, Keisuke TAMURA
Nihon University, Japan

17:30 - 17:50 MCH-11

A MINIATURE RAILWAY VEHICLE FOR SENSOR-CARRYING

Max T.-K. HOU¹, Hui-Mei SHEN¹, Chiang-Ni LU¹, I-Jen HSU², Jerliang A. YEH³

1: National United University, Taiwan

2: Chung Yuan Christian University, Taiwan

3: National Tsing Hua University, Taiwan

17:50 - 18:10 MCH-12

MONOLITHICALLY INTEGRATION OF GaN LIGHT-EMITTING DIODE AND Si SUBSTRATE WITH AlN/GaN SUPERLATTICE AS INTERLAYER

Fang Ren HU, M. WAKUI, H. SAMESHIMA, R. ITO, Kazuhiro HANE
Tohoku University, Japan

Technical Program of Poster Session

6 / 18 (13:50 - 15:10)

Room 5 (406)

Head / Disk Interface and Tribology

P-HDI-01

SUSPENSION STIFFNESS MATRIX ESTIMATION AND UNLOADING ANALYSIS WITH THE FINITE ELEMENT METHOD

Yan LIU, Hejun DU, Shao WANG

Nanyang Technological University, Singapore

P-HDI-02

ESTIMATION OF SUSPENSION STIFFNESS MATRICES WITH EXPERIMENTS

Yan LIU, Hejun DU, Shao WANG

Nanyang Technological University, Singapore

P-HDI-03

SLIDER FLYING OVER BIT PATTERNED MEDIA USING THE DIRECT SIMULATION MONTE CARLO METHOD

Hui LI¹, Kensuke AMEMIYA¹, Frank E. TALKE²

1: Hitachi Asia Ltd., Singapore

2: University of California, San Diego, USA

P-HDI-04

FINITE ELEMENT SIMULATION OF CONTACT OF SLIDER WITH PATTERNED MEDIA

Hui LI¹, Kensuke AMEMIYA¹, Frank E. TALKE²

1: Hitachi Asia Ltd., Singapore

2: University of California, San Diego, USA

P-HDI-05

MOLECULAR GAS-FILM LUBRICATION ANALYSES OF A SLIDER OVER A DISK WITH GROOVES (STATIC AND DYNAMIC FLYING CHARACTERISTICS OF A 3-DOF SLIDER)

Atsushi SATO, Hiroshige MATSUOKA, Shigehisa FUKUI

Tottori University, Japan

P-HDI-06

DYNAMIC BEHAVIOR OF A THIN LIQUID SURFACE BY REPETITIVELY APPLIED STRESS (NUMERICAL ANALYSES BY LONG-WAVE EQUATION)

Kota HOZUMI, Hiroyuki ISHIBASHI, Shigehisa FUKUI, Hiroshige MATSUOKA

Tottori University, Japan

P-HDI-07

DEFORMATION CHARACTERISTICS OF ULTRA-THIN LIQUID FILM CONSIDERING TEMPERATURE AND FILM THICKNESS DEPENDENCE OF SURFACE TENSION (NUMERICAL ANALYSES BY THE LONG WAVE EQUATION)

Kouji OKA, Yuusuke YAMASHITA, Hiroyuki ISHIBASHI, Fumihiko SAEKI, Hiroshige MATSUOKA, Shigehisa FUKUI

Tottori University, Japan

P-HDI-08

INVESTIGATION OF MECHANICAL CLEARANCE CHANGE WITH THERMAL FLY-HEIGHT CONTROL SLIDER AT HIGH ALTITUDE

Satoru OOKUBO, Toshiya SHIRAMATSU, Masayuki KURITA, Hidekazu KOHIRA, Yoshinori TAKEUCHI
Hitachi Global Storage Technologies, Japan

P-HDI-09

A NUMERICAL STUDY OF HEAD-ULTRATHIN LUBRICANT INTERACTION BY MOLECULAR DYNAMICS SIMULATION

Xiangjun LIU¹, Kensuke AMEMIYA¹, Chee How WONG², Shengkai YU², Bo LIU²

1: Hitachi Asia Ltd., Singapore

2: Data Storage Institute, Singapore

P-HDI-10

NANO SCALE GAS COUETTE FLOW CONSIDERING WALL POTENTIAL USING MODIFIED DSMC METHOD

Kiyomi YAMANE¹, Taishi YOSHIOKA¹, Shigehisa FUKUI²

1: Matsue College of Technology, Japan

2: Tottori University, Japan

Drive Mechanisms

P-DVM-01

STUDY ON A NOVEL MAGNETIC HEAD POSITIONING MECHANISM USING CONTACT FORCE

Yuta KAMOSHITA, Hiroshi YAMAURA

Tokyo Institute of Technology, Japan

P-DVM-02

CONTROLLING VIBRATION FEATURE OF HDD ACTUATOR USING DUMMY HEADS

Noritaka OTAKE¹, Keiko WATANABE¹, Toshihiko SHIMIZU¹, Kenji TOMIDA², Toshihiro ARISAKA²

1: Hitachi Ltd., Japan

2: Hitachi Global Storage Technologies Japan, Ltd., Japan

P-DVM-03

DYNAMIC STRAIN MEASUREMENT OF THE SUSPENSION OF A SMALL FORM FACTOR HDD

Bin GU¹, Dong-Wei SHU¹, Bao-Jun SHI²

1: Nanyang Technological University, Singapore

2: Shandong Jianzhu University, China

Servo Control

P-SVC-01

AN EFFICIENT ACTIVE VIBRATION SUPPRESSION MODEL FOR HDD TRACK SERVO

Yan LIU, Hejun DU

Nanyang Technological University, Singapore

P-SVC-02

MICROMECHATRONICS CONTROL METHODOLOGY BASED ON THE MODIFIED DELTA OPERATOR AND FORM USING BANG-BANG CONTROL

Tatsu AOKI

Tokyo Metropolitan College of Industrial Technology, Japan

Micro/Nanomechatronics

P-MCH-01

LOW-INSERTION-LOSS 8 x 8 OPTICAL MATRIX SWITCH USING MEMS ANALOG-CONTROL MIRROR

Atsushi KAZAMA¹, Yasuhiro ITOH², Masaya HORINO¹, Kazuyuki FUKUDA¹,
Masatoshi KANAMARU¹, Takeshi HARADA¹, Akiko IIZUKA¹, Ryoji OKADA¹

- 1: Hitachi Ltd., Japan
- 2: Hitachi Metals Ltd., Japan

P-MCH-02

FABRICATION OF HIGH ASPECT RATIO MICRO-STRUCTURES USING SUPERCRITICAL DRYING TECHNOLOGY

Norifumi OOTANI¹, Fumikazu OOHIRA¹, Takaaki SUZUKI¹, Satoru KADORIKU²

- 1: Kagawa University, Japan
- 2: RyuSyo Industrial Co., Ltd., Japan

P-MCH-03

LOCALIZED SUBSTANCE DELIVERY TO SINGLE CELL BY THREE DIMENSIONAL MICROFLUIDIC DEVICE

Kyohei TERAO^{1,2}, Murat GEL^{2,3}, Atsuhito OKONOJI^{2,4}, Teru OKITSU^{2,5}, Takaaki SUZUKI^{1,2},
Masao WASHIZU^{2,3}, Hidetoshi KOTERA^{2,5}

- 1: Kagawa University, Japan
- 2: JST-CREST, Japan
- 3: The University of Tokyo, Japan
- 4: Kyoto University, Japan
- 5: Kyoto University Hospital, Japan

P-MCH-04

PIEZOELECTRIC MICROPUMPING SYSTEM USING PZT THIN FILMS

Isaku KANNO, Junya OGAWA, Hidetoshi KOTERA
Kyoto University, Japan

Bio-medical Equipments

P-BIO-01

DEVELOPMENT OF LCD SLICE IMAGE OVERLAY DEVICE WITH ELECTROMAGNETIC WAVE MEASUREMENT

Ikuma SATO¹, Akio FUNAKUBO², Hiroki KAMIUCHI¹, Hongen LIAO³, Hiromasa YAMASHITA¹,
Takeyoshi DOHI¹, Ken MASAMUNE¹

- 1: The University of Tokyo, Graduate School of Information Science and Technology, Japan
- 2: Tokyo Denki University, Japan
- 3: The University of Tokyo, Graduate School of Engineering, Japan

P-BIO-02

EVALUATION OF CONTROLLING ALGORITHM FOR AUTOMATIC INSTRUMENT INSERTING FUNCTION OF SCRUB NURSE ROBOT (SNR)

Kitaro YOSHIMITSU¹, Fujio MIYAWAKI², Yasuhiro FUKUI², Daijo HASHIMOTO³, Ken MASAMUNE⁴

- 1: Tokyo Women's Medical University, Japan
- 2: Tokyo Denki University, Japan
- 3: Saitama Medical Center & Medical University, Japan
- 4: The University of Tokyo, Japan

P-BIO-03

REMARKS ON HUMAN BODY POSTURE ESTIMATION FROM SILHOUETTE IMAGE USING 3D ARTICULATED HUMAN CG MODEL

Takashi OIDA, Kazuhiko TAKAHASHI, Masafumi HASHIMOTO
Doshisha University, Japan

P-BIO-04

REMARKS ON IMPROVEMENT OF MARKERLESS HUMAN MOTION CAPTURE FROM VOLUME RECONSTRUCTION

Ken UEDA, Kazuhiko TAKAHASHI, Masafumi HASHIMOTO
Doshisha University, Japan

P-BIO-05

OPTIMIZATION OF SUSPENDED MICROCHANNEL RESONATOR WITH INTEGRATED PIEZORESISTIVE READOUT AS A HIGH Q-FACTOR BIOMOLECULAR RECOGNITION SYSTEM IN AQUEOUS ENVIRONMENT

Mehrdad MOTTAGHI¹, Habib Badri GHAVIFEKR²

- 1: Sahand University of Technology, Department of Mechanical Engineering, Biomechanics Division, Iran
- 2: Sahand University of Technology, Department of Electrical Engineering, Microelectronics Division, Iran

Imaging and Printing Technologies

P-IMG-01

MULTI-OPTICAL BEAM ALIGNMENT SYSTEM FOR MICRO-PROJECTION

Jiro HASHIZUME, Tomoki KOBORI, Yoshiho SEO, Yasuhiko AMANO, Etsuko NOMOTO
Hitachi Ltd., Japan

P-IMG-02

ANALYSIS OF NON-MAGNETIC SINGLE COMPONENT DEVELOPMENT SYSTEM IN ELECTROPHOTOGRAPHY

Takatoshi MIWA, Tomohiko SUGIYAMA, Wataru FURUICHI, Hiroyuki KAWAMOTO
Waseda University, Japan

P-IMG-03

ELECTROSTATIC INKJET FOR MICRO-FILM FORMATION

Nozomi YOSHIDA, Masato NISHIURA, Kazuyuki TADA, Hiroyuki KAWAMOTO
Waseda University, Japan

P-IMG-04

BEAD CARRY-OUT IN TWO-COMPONENT BRUSH SYSTEM OF ELECTROPHOTOGRAPHY

Tatsushi MURAKAMI, Satoshi IESAKA, Takashi ADACHI, Hiroyuki KAWAMOTO
Waseda University, Japan

MM/Micro/Nano Precision Equipments

P-PRE-01

SMALL HOLE MACHINING USING A COMBINATION OF A 5-DOF CONTROLLED MAGLEV ACTUATOR AND A CONVENTIONAL ELECTRICAL DISCHARGE MACHINE

Yoshitaka UHEYAMA¹, Tadahiko SHINSHI¹, Xiaoyou ZHANG¹, Akira SHIMOKOHBE¹, Tatsushi SATO²,
Hidetaka MIYAKE², Takayuki NAKAGAWA²

- 1: Tokyo Institute of Technology, Japan
- 2: Mitsubishi Electric Corporation, Japan

P-PRE-02

DEVELOPMENT OF A MICRO-MOTION STAGE FOR MECHATRONICS DEVICES

Yasuhiro MATSUDA, Shigeo NAKAMURA
Hitachi Ltd., Japan

P-PRE-03

PRINCIPLE AND BASIC CHARACTERISTICS OF A NEW OPTICAL MEMS SWITCH USING A BELT-SHAPED THIN FILM MIRROR

Kazutoshi OKUTSU, Yuuki MATSUMOTO, Kaiji SATO
Tokyo Institute of Technology, Japan

P-PRE-04

OPTICAL MEASUREMENT OF SURFACE PROFILES OF MICROSTRUCTURES USING FOCUS ERROR SIGNAL

Jaehyun KIM, Jungyul PARK, Bu Hyun SHIN, Seung-Yop LEE
Sogang University, Republic of Korea

P-PRE-05

STUDY ON THE MICROSURGERY SUPPORT SYSTEM USING THE SMA MICROMANIPULATOR

Yuichi NAKAZATO¹, Shotaro KAGEYAMA¹, Kazutoyo YUASA¹, Mikio HORIE²
1: Nippon Institute of Technology, Japan
2: Tokyo Institute of Technology, Japan

Micro/Nanosystem Science and Technology

P-MNS-01

EVALUATION OF NANOMETER SCALE MECHANICAL PROPERTIES OF EXTREMELY THIN DIAMOND-LIKE CARBON (DLC) FILMS

Wataru KUROSAKA, Kouich OSHIMOTO, Shojiro MIYAKE
Nippon Institute of Technology, Japan

P-MNS-02

VIBRATION PROCESSING AND PROCESSED SURFACE EVALUATION OF NANOPERIOD MULTILAYER FILMS BY ATOMIC FORCE MICROSCOPY

Shojiro MIYAKE, Shintaro KAWASAKI, Tang LEMING, Wataru KUROSAKA
Nippon Institute of Technology, Japan

P-MNS-03

FRICTION AND WEAR SURFACE MONITORING DURING TRIBOLOGICAL TEST FOR SEVERAL METALS

Seisuke KANO, Takeshi SUZUKI
National Institute of Advanced Industrial Science and Technology (AIST), Japan

P-MNS-04

STUDY ON SURFACE ENERGY OF ULTRATHIN FILM (VERIFICATION OF EFFECTIVE DISPERSION COMPONENT THEORY)

Katsunori ONO, Masaya KANNEN, Hiroshige MATSUOKA, Shigehisa FUKUI
Tottori University, Japan

P-MNS-05

FRICTION ANISOTROPY BETWEEN DIFFERENT MATERIALS MEASURED UNDER HIGH VACUUM CONDITION

Yu TAMURA¹, Yasuhisa ANDO², Ken'ichi HIRATSUKA¹
1: Chiba Institute of Technology, Japan
2: National Institute of Advanced Industrial Science and Technology (AIST), Japan

P-MNS-06

HIGHLY-EFFICIENT METHOD FOR FABRICATING NANO GROOVES USING MULTILAYER FILMS

Akira MIZUNO, Yasuhisa ANDO, Akihiro TANAKA, Koji MIYAKE, Atsushi KORENAGA
National Institute of Advanced Industrial Science and Technology (AIST), Japan

P-MNS-07

NANOTRANSFER METHOD OF THE FERROELECTRIC FILMS ONTO THE POLYMER SUBSTRATE

Masaaki ICHIKI^{1,2}, Sho MAKINO¹, Tadatomo SUGA¹, Ryutaro MAEDA³

1: The University of Tokyo, Japan

2: JST-CREST, Japan

3: National Institute of Advanced Industrial Science and Technology (AIST), Japan

Optical Storage / Optical Devices for Storage

P-OPT-01

TRACKING CHARACTERISTICS OF A TRIANGULAR APERTURE MOUNTED OPTICAL HEAD SLIDER APPLIED A POLARIZED VIOLET LASER SOURCE

Toshifumi OHKUBO¹, Majung PARK², Masakazu HIRATA², Manabu OUMI², Kunio NAKAJIMA²

1: Toyo University, Japan

2: Seiko Instruments Inc., Japan

P-OPT-02

INCREASE OF TEMPERATURE OF A LIGHT SOURCE (LASER DIODE) IN A HARD DISK DRIVES

Shigeo NAKAMURA, Shigeyuki SASAKI, Shigeo OHASHI

Hitachi Ltd., Japan

P-OPT-03

AN ANTI-SHOCK CONTROL METHOD USING AN ACCELEROMETER AND INVERSE IMPULSE FOR SIL-BASED NEAR FIELD RECORDING SYSTEM

Hyunwoo HWANG¹, Jung-Gon KIM², Won-Ho SHIN¹, Hyunseok YANG¹, No-Cheol PARK¹, Young-Pil PARK¹, Kyoung-Su PARK²

1: Yonsei University, Department of Mechanical Engineering, Republic of Korea

2: Yonsei University, Center of Information Storage Device, Republic of Korea

P-OPT-04

OPTIMAL DESIGN OF DYNAMIC VIBRATION ABSORBER USING L-SHAPED BEAM FOR REDUCING OPTICAL DISK DRIVE VIBRATION

Ungrae CHO¹, Seungho LIM¹, No-Cheol PARK¹, Young-Pil PARK¹, Kyoung-Su PARK¹, Wook-Young SOH²

1: Yonsei University, Republic of Korea

2: Hitachi-LG Data Storage, Japan

P-OPT-05

EVALUATION OF SERVO METHOD DESIGNED FOR THE HOLOGRAPHIC DATA STORAGE SYSTEM

Sang-Hoon KIM¹, Hee-Chan SONG¹, Sung Yong LIM¹, Hyunseok YANG¹, Joo-Youn PARK², Young-Pil PARK¹

1: Yonsei University, Center for Information Storage Device, Republic of Korea

2: Daewoo Electronics Corp., Republic of Korea

P-OPT-06

DESIGN OF MOVING MAGNET TYPE ACTUATOR CONSIDERING EFFECT OF COIL ELECTROMAGNET

Young-Jun HUR¹, Myeong-Gyu SONG², No-Cheol PARK¹, Jeonghoon YOO¹, Young-Pil PARK¹, Kyoung-Su PARK¹

1: Yonsei University, Department of Mechanical Engineering, Republic of Korea

2: Yonsei University, Center for Information Storage Devices, Republic of Korea