# IIP/ISPS Joint MIPE2009 Conference Schedule

Tsukuba International Congress Center, Ibaraki, Japan  
6/17 (Wed.) – 20 (Sat.)

## 6/17 (Wed.)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>17:00 - 20:00</td>
<td>Registration</td>
</tr>
<tr>
<td>18:00 - 20:00</td>
<td>Welcome reception at Restaurant (1F)</td>
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</tbody>
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## 6/18 (Thur.)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00 - 17:00</td>
<td>Participants’ Briefing at Restaurant (1F)</td>
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<tr>
<td>8:00 - 17:00</td>
<td>Registration</td>
</tr>
<tr>
<td>8:50 to 9:00</td>
<td>Opening Remarks from Prof. Fukui at Room1</td>
</tr>
</tbody>
</table>
| 9:00 - 10:40 | Room1 (201A)  
Intelligent Machines I  
Oral Presentations  
(INT-01 to 05)  
Room2 (201B)  
Servo Control I  
Oral Presentations  
(SVC-01 to 05)  
Room3 (202A)  
Head/Disk Interface and Tribology I  
Oral Presentations  
(HDI-01 to 04)  
Room4 (202B)  
Flexible Media Feeding and Handling Machines I  
Oral Presentations  
(FMF-01 to 05) |
| 9:20 to 10:40 | Oral Presentations  
(INT-01 to 05)  
Oral Presentations  
(SVC-01 to 05)  
Oral Presentations  
(HDI-01 to 04)  
Oral Presentations  
(FMF-01 to 05) |
| 10:40 to 11:00 | BREAK                                                                  |
| 11:00 - 12:20 | Room1 (201A)  
Intelligent Machines II  
Keynote Address  
(Prof. OHKA)  
Oral Presentations  
(INT-06 to 07)  
Room2 (201B)  
Servo Control II  
Keynote Address  
(Prof. CALLAFON)  
Oral Presentations  
(SVC-06 to 07)  
Room3 (202A)  
Head/Disk Interface and Tribology II  
Oral Presentations  
(HDI-05 to 08)  
Room4 (202B)  
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 - 16:50 | Room1 (201A)  
Intelligent Machines III  
Oral Presentations  
(INT-08 to 11)  
Room2 (201B)  
Micro/Nanosystem Science and Technology I  
Oral Presentations  
(MNS-01 to 04)  
Room3 (202A)  
Head/Disk Interface and Tribology III  
Oral Presentations  
(HDI-09 to 12)  
Room4 (202B)  
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 | Room1 (201A)  
Intelligent Machines IV  
Oral Presentations  
(INT-12 to 15)  
Room2 (201B)  
Micro/Nanosystem Science and Technology II  
Oral Presentations  
(MNS-05 to 08)  
Room3 (202A)  
Head/Disk Interface and Tribology IV  
Oral Presentations  
(HDI-13 to 15)  
Room4 (202B)  
Flexible Media Feeding and Handling Machines IV  
Oral Presentations  
(FMF-12 to 15) |
### 6/19 (Fri.)

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00 -</td>
<td><strong>Participants’ Briefing at Restaurant (1F)</strong></td>
</tr>
<tr>
<td>8:00 to 17:00</td>
<td>Registration</td>
</tr>
</tbody>
</table>
| 9:00 to 10:40 | Room1 (201A)  
  Drive Mechanisms I  
  Oral Presentations (DVM-01 to 05)  
  Room2 (201B)  
  Micro/Nanosystem Science and Technology III  
  Oral Presentations (MNS-09 to 13)  
  Room3 (202A)  
  MM/Micro/Nano Precision Equipments I  
  Keynote Address (Prof. OOHIRA)  
  Oral Presentations (PRE-01 to 02)  
  Room4 (202B)  
  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 | Room1 (201A)  
  Drive Mechanisms II  
  Oral Presentations (DVM-06 to 08)  
  Room2 (201B)  
  Micro/Nanosystem Science and Technology IV  
  Keynote Address (Dr. NAKANO)  
  Oral Presentations (MNS-14 to 15)  
  Room3 (202A)  
  MM/Micro/Nano Precision Equipments II  
  Oral Presentations (PRE-03 to 06)  
  Room4 (202B)  
  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 | Dinner Party (Buffet-style) at Multi-Purpose Hall (1F)              |

### 6/20 (Sat.)

<table>
<thead>
<tr>
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<tr>
<td>8:00 -</td>
<td><strong>Participants’ Briefing at Restaurant (1F)</strong></td>
</tr>
<tr>
<td>8:00 to 16:00</td>
<td>Registration</td>
</tr>
</tbody>
</table>
| 9:00 to 10:40 | Room1 (201A)  
  Drive Mechanisms III  
  Oral Presentations (DVM-09 to 11)  
  Room2 (201B)  
  Simulations of Micro/Nano Scale Phenomena I  
  Keynote Address (Dr. SASAKI)  
  Oral Presentations (SIM-01 to 03)  
  Room3 (202A)  
  MM/Micro/Nano Precision Equipments III  
  Oral Presentations (PRE-07 to 09)  
  Room4 (202B)  
  Bio-medical Equipments III  
  Oral Presentations (BIO-08 to 12) |
| 10:40 to 11:00 | **BREAK**                                                             |
| 11:00 to 12:20 | Room1 (201A)  
  Drive Mechanisms IV  
  Oral Presentations (DVM-12 to 15)  
  Room2 (201B)  
  Simulations of Micro/Nano Scale Phenomena II  
  Oral Presentations (SIM-04 to 07)  
  Room3 (202A)  
  MM/Micro/Nano Precision Equipments IV  
  Oral Presentations (PRE-10 to 13)  
  Room4 (202B)  
  Micro/Nanomechatronics I  
  Keynote Address (Prof. WASHIZU)  
  Oral Presentations (MCH-01 to 02) |
| 12:20 to 13:50 | **LUNCH**                                                            |
| 13:50 to 15:10 | **Imaging and Printing Technologies I**                              |
| 14:30 – 14:50 | **BREAK**                                                             |
| 14:50 to 16:10 | **Imaging and Printing Technologies II**                             |
| 15:30 to 16:30 | **Optical Storage/Optical Devices for Storage I**                   |
| 15:10 to 15:30 | **BREAK**                                                             |
| 15:30 to 16:30 | **Optical Storage/Optical Devices for Storage II**                 |
| 16:00 to 17:00 | **Micro/Nanomechatronics IV**                                  |
Map of Conference Rooms

1 F

Dinner Party (Buffet-style)  
(6/19 18:30 – 20:30)

Registration site  
(6/17 17:00 – 20:00)

Multi-Purpose Hall

Main Entrance

Entrance

Registration site (6/18 - 20)

Restaurant ESPOIR

Welcome Reception (6/17 18:00 – 20:00)

To Hotel

To Hotel

2 F

Room 1: Intelligent Machines (6/18), Drive Mechanisms (6/19, 6/20), Imaging and Printing Technologies (6/20)

Room 2: Servo Control (6/18), Micro/Nanosystem Science and Technology (6/18, 6/19), Simulations of Micro/Nano Scale Phenomena (6/20)

Room 3: Head/Disk Interface and Tribology (6/18), MM/Micro/Nano Precision Equipments (6/19, 6/20), Optical Storage/Optical Devices for Storage (6/20)

Room 4: Flexible Media Feeding and Handling Machines (6/18), Bio-medical Equipment (6/19, 6/20), Micro/Nanomechatronics (6/20)
Workshop (6/19 13:50 – 18:00)

Executive Office of MIPE2009

Room 5: Poster session (6/18)
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
Science in MEMS: 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 for 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 possibly applications in the field of information devices.
15:20 – 16:00 WS-03
HDD Technology: A Forward Look
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 Human-Machine 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 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 Seisakusyo, 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 MAHALANOBISS 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 SANPONPUT, Rugkanawan KONGKAVITUL,
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
Oral Presentations 6/18 to 6/20

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 A 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 Corporate Research & Development Center, 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 CNₓ 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, Yasuhiisa ANDO¹, Shinya SASAKI¹,²  
1: National Institute of Advanced Industrial Science and Technology (AIST), Japan  
2: Tokyo University of Science, Japan

(16:30 - 17:10 BREAK)
Oral Presentations 6/18 to 6/20

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 SUZUKI1, 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
Oral Presentations 6/18 to 6/20

6 / 18
Room 3 (202A)

6 / 18 Room 3 (202A)
Head / Disk Interface and Tribology I (9:20 – 10:40)
Chair: Dr. Mike SUK (Samsung)

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 MATSUI¹, Zhisheng DENG²
1. TDK Corporation Technical Center, Japan
2. SAE Magnetics (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: Dr. Junguo XU (Hitachi, Japan)

11:00 - 11:20 HDI-05
HIGH-SPEED TRIBOLOGICAL MEASUREMENT 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 MITSUYA¹, 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)
Fumihiro 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: Prof. Hiroshige MATSUOKA (Tottori University, Japan)

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 THE UNLOADING PROCESS WITH APPLICATION TO PARAMETRIC STUDIES AND TREND ANALYSES
Yan LIU, Hejun DU, Shao WANG
Nanyang Technological University, Singapore

(16:30 – 17:10 BREAK)

6 / 18 Room 3 (202A)
Head / Disk Interface and Tribology IV (17:10 – 18:10)
Chair: Prof. Youichi KAWAKUBO (Shinshu University, Japan)

17:10 - 17:30 HDI-13
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

17:30 - 17:50 HDI-14
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
17:50 - 18:10  HDI-15

ELECTRIC FIELD ASSISTED DIP COATING PROCESS OF ULTRA-THIN PFPE LUBRICANT FILM FOR MAGNETIC DISKS
Hiroshi TANI¹, Masami KUBOTA², Masayuki KANDA², Motohiro TERAO², Norio TAGAWA¹

¹: Kansai University, Japan
²: Kubota Comps Co., Japan
6 / 18 Room 4 (202B)

Flexible Media Feeding and Handling Machines I (9:00 – 10:40)
Chair: Prof. Hiromu HASHIMOTO (Tokai University, Japan)

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, Kiyoung 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: Prof. Hiromu HASHIMOTO (Tokai University, Japan)

11:00 - 11:20  FMF-06
CONTACT CHARACTERISTICS OF A RUBBER ROLLER AND A FLEXIBLE MEDIUM
Kyosuke ONO
KO Dynamic 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 KUDOU, 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: Prof. Hiromu HASHIMOTO (Tokai University, Japan)

15:30 - 16:10 FMF-K    Keynote Address
IMPORTANCE OF WEB HANDLING TECHNOLOGY –THE FUTURE IS A FLEXIBLE–
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: Prof. Hiromu HASHIMOTO (Tokai University, Japan)

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 AKEZINE¹, Hiromu HASHIMOTO²
¹: LINTEC Corporation, Japan
²: Tokai University, Japan
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

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)
Chairs: Dr. Jen-Yuan (James) Chang (Massey University, New Zealand) and Dr. Takehiko Eguchi (Hitachi, Japan)

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 – 12:00)
Chair: Dr. Toshiki HIRANO (Hitachi GST, USA)

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
11:40 - 12:00  DVM-08
SHOCK RESPONSE IN DROP TEST SIMULATION OF A SMALL FORM FACTOR DISK DRIVE
Bin GU\textsuperscript{1}, Dong-Wei SHU\textsuperscript{1}, Bao-Jun SHI\textsuperscript{2}
1:  Nanyang Technological University, Singapore
2:  Shandong Jianzhu University, China

(12:00 – 13:50 LUNCH)

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

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

(18:30 – 20:30 DINNER PARTY AT MULTI-PURPOSE HALL)
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 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
DEVELOPMENT OF ELECTROHYDRODYNAMIC (EHD) MICROPUMP TO GENERATE OSCILLATING FLOW AT LOW FREQUENCIES
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, Tomoaki MATUSUOKA2, 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

(10:40 - 11:00 BREAK)
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 DINNER PARTY AT MULTI-PURPOSE HALL)
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**
APPLICATIONS 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 HASIGUTI²
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 ISHIMORI², 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 DINNER PARTY AT MULTI-PURPOSE HALL)
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 KIM³, Seung-Yop LEE²
1: Nanostorage Inc., Republic of Korea
2: Sogang University, Republic of Korea

(10:20 – 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 SHUZO¹,², Shintaro KOMORI¹, Tomoko TAKASHIMA¹,², Guillaume LOPEZ¹,², Seiji TATSUTA¹,²,³, Shintaro YANAGIMOTO¹,²,³, Shinichi WARISAWA¹,²,³, Jean-Jacques DELAUNAY¹,²,³, Ichiro YAMADA¹,²,³
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 LOPEZ¹,²,³, Masaki SHUZO¹,²,³, Hiroyuki USHIDA¹, Keita HIDAKA¹, Shintaro YANAGIMOTO¹,²,³, Yasushi IMAI¹,²,³, Akio KOSAKA¹,²,³, Jean-Jacques DELAUNAY¹,²,³, Ichiro YAMADA¹,²,³
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 KINEMATIC PATELLAR TENDON REFLEX RESPONSES
Yasuaki OHTAKI¹, Naotaka MAMIZUKA², Mohammad FARD³, Yoshinori HARADA⁴, Naoyuki OCHIAI⁴
1: University of Yamanashi, 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 DINNER PARTY AT MULTI-PURPOSE HALL)
6 / 20 Room 1 (201A)

Drive Mechanisms III (9:40 – 10:40)
Chair: Dr. Jen-Yuan (James) Chang (Massey University, New Zealand) and Dr. Shigeo NAKAMURA (Hitachi, Japan)

9:40 - 10:00  DVM-09
HDD FLEX CABLE VIBRATIONS CONSIDERING BOUNDARY GEOMETRICAL TOLERANCES
Jen-Yuan (James) CHANG
Massey University, New Zealand

10:00 - 10:20  DVM-10
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-11
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)
Chair: Dr. Keiji ARUGA (Ferrotec, Japan)

11:00 - 11:20  DVM-12
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-13
AIRFLOW INDUCED VIBRO-ACOUSTICS ANALYSIS OF HDD
Wu Zhong LIN, Feng GAO, Eng Hong ONG
Data Storage Institute, Singapore

11:40 - 12:00  DVM-14
FLOW-INDUCED VIBRATION REDUCTION FOR HARD DISK DRIVE WITH A WINDOW SPOILER
Masato IKEGAWA, Hiroshi MUKAI
Hitachi Ltd., Japan

12:00 - 12:20  DVM-15
THERMAL ANALYSIS OF HELIUM-FILLED ENTERPRISE DISK DRIVE
Jiapeng 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 UMEZU¹,², 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 VISCOSOUS 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 ALGORISM 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
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, Hitoshi SETOGAWA², Ugur MART², Ai SUZUKI³, Hideyuki TSUBOI³,
Nozomu HATAKEYAMA², Akira ENDOU², Hiromitsu TAKABA⁴, Carlos A. Del CARPIO²,
Akira MIYAMOTO³,⁴²
  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)

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 SAITO¹, Yoshiaki YONEKAWA²
  1: Kansai University, Faculty of Engineering Science, Japan
  2: Kansai University, Graduate School of Engineering, 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
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, Department of Complex Systems Science, Japan
²: Nagoya University, Department of Micro-Nano Systems 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 MART¹,², Hideyuki TSUBOI¹, Nozomu HATAKEYAMA¹, Akira ENDOU¹, Hiromitsu TAKABA¹, Carlos A. Del CARPIO¹, Toshiyuki TSUBOUCHI¹, Akira MIYAMOTO¹²
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)
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 ZHANG\textsuperscript{1}, Shinji KOMATSU\textsuperscript{1}, Kenji FUKUZAWA\textsuperscript{2}, Shintaro ITOH\textsuperscript{2}
1: Nagoya University, Department of Complex Systems Science, Japan
2: Nagoya University, Department of Micro-Nano Systems Engineering, Japan

15:50 - 16:10 SIM-13
SIMULATION OF PICO-FORCE DETECTION IN LATERAL-MODE DYNAMIC AFM
Naruo SASAKI\textsuperscript{1}, Shigeki KAWAI\textsuperscript{2,3}, Hideki KAWAKATSU\textsuperscript{2}
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 NISHIMURA\textsuperscript{1}, Aiichiro NAKANO\textsuperscript{2}
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 (10:20 – 10:40)
Chair: Prof. Kaiji SATO (Tokyo Institute of Technology, Japan)

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
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

11:40 - 12:00 PRE-12
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

12:00 - 12:20 PRE-13
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

(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, Yasuhiyo IWANABE¹, Satoshi ARAI², Toshio TAKAHASHI¹, Shigeyuki SASAKI¹, Shigeo NAKAMURA¹, 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 – 16:30)
Chairs: Dr. Shigeo NAKAMURA (Hitachi Ltd., Japan)

15:30 - 15:50 OPT-03
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, 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

15:50 - 16:10 OPT-04
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

16:10 - 16:30 OPT-05
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)

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 TSUCHIMI\(^1\), Takeshi OKUYAMA\(^2\), Mami TANAKA\(^1\)
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 OKUYAMA\(^1\), Manabu OTSUKI\(^2\), Ryota KOMIYA\(^3\), Nozomu SUGOH\(^3\), Mami TANAKA\(^2\)
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 SAKAMOTO\(^1\), Kohei TAKAGI\(^1\), Tokuhiro SUGIURA\(^2\), Yoshihiko NOMURA\(^3\)
1: Mie University, Faculty 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)

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 HIRAMARU\(^1\), Takaaki SUZUKI\(^2\), Ariko FUKE\(^1\), Hiroyuki SUZUKI\(^2\), Isaku KANNO\(^1\),
Hidetoshi KOTERA\(^1\)
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 OKONOGI1,2, Kyohei TERAO4, 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 – 13:20 LUNCH)

6 / 20 Room 4 (202B)
Micro/Nanomechatronics II (13:20 – 14:20)
Chair: Prof. Takaaki SUZUKI (Kagawa University, Japan)

13:20 - 13:40 MCH-03
EFFECT OF AC DRIVE IN CONTROL OF MEMS MIRROR TILT ANGLE
Naru NEMOTO, Joji YAMAGUCHI, Fusao SHIMOKAWA
Nippon Telegraph and Telephone Corp., Japan

13:40 - 14:00 MCH-04
SHAPE MEMORY PIEZOELECTRIC ACTUATOR WITH ASYMMETRIC VOLTAGE OPERATION
Yoichi KADOTA, Hiroshi HOSAKA, Takeshi MORITA
The University of Tokyo, Japan

14:00 - 14:20 MCH-05
CHARACTERISTICS OF RESONANT MICRO MIRROR IN VACUUM
Chu Hoang MANH, Kazuhiro HANE
Tohoku University, Japan

(14:20 – 14:30 BREAK)

6 / 20 Room 4 (202B)
Micro/Nanomechatronics III (14:30 – 15:50)
Chair: Prof. Takaaki SUZUKI (Kagawa University, Japan)

14:30 - 14:50 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

14:50 - 15:10 MCH-07
IMPROVEMENT OF SELF-SENSING PIEZOELECTRIC ACTUATOR CONTROL USING PERMITTIVITY CHANGE DETECTION
Yusuke ISHIKIRIYAMA, Takeshi MORITA
The University of Tokyo, Japan

15:10 - 15:30 MCH-08
AN ADAPTIVE MECHANICAL RESONATOR FOR WIDEBAND VIBRATION ENERGY HARVESTING
Hiroshi OKAMOTO, Yuichiro HAMATE, Hiroki KUWANO
Tohoku University, Japan
15:30 - 15:50  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

(15:50 – 16:00 BREAK)

6 / 20 Room 4 (202B)  
Micro/Nanomechatronics IV (16:00 – 17:00)  
Chair: Prof. Kyohei TERAO (Kagawa University, Japan)

16:00 - 16:20  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

16:20 - 16:40  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

16:40 - 17:00  MCH-12  
MONOLITHICALLY INTEGRATION OF GaN LIGHT-EMITTING DIODE AND Si SUBSTRATE WITH AIN/GaN SUPERLATTICE AS INTERLAYER  
Fang Ren HU, M. WAKUI, H. SAMESHIMA, R. ITO, Kazuhiro HANE  
Tohoku University, Japan
Layout of Poster Presentations

Room 5 (406, 4 F)
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 LI\textsuperscript{1}, Kensuke AMEMIYA\textsuperscript{1}, Frank E. TALKE\textsuperscript{2}  
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 LI\textsuperscript{1}, Kensuke AMEMIYA\textsuperscript{1}, Frank E. TALKE\textsuperscript{2}  
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, Fumihiro 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 LIU, Kensuke AMEMIYA, Chee How WONG, Shengkai YU, Bo LIU
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 YAMANE, Taishi YOSHIOKA, Shigehisa FUKUI
1: Matsue College of Technology, Japan
2: Tottori University, Japan

P-HDI-11
FEASIBILITY STUDY OF ULTRA-LOW PARTICLE COUNT MEDIA OVERCOAT DEPOSITED BY FCA METHOD FOR 2 Tbps HDDs
Norikazu NAKAMURA, Hiroshi Chiba, Shoichi MIYAHARA
Fujitsu Laboratories Ltd., Japan

Drive Mechanisms

P-DVM-01
STUDY ON A NOVEL MAGNETIC HEAD POSITIONING MECHANISM USING CONTACT FORCE
Yuta KAMOSHITA, Hiroshi YAMURA
Tokyo Institute of Technology, Japan

P-DVM-02
CONTROLLING VIBRATION FEATURE OF HDD ACTUATOR USING DUMMY HEADS
Noritaka OTAKE, Keiko WATANABE, Toshihiko SHIMIZU, Kenji TOMIDA, Toshihiro ARISAKA
1: Hitachi Ltd., Japan
2: Hitachi Global Storage Technologies Japan, Ltd., Japan

Servo Control

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 KAZAMA, Yasuhiro ITOH, Masaya HORINO, Kazuyuki FUKUDA, Masatoshi KANAMARU, Takeshi HARADA, Akiko IIZUKA, Ryoji OKADA
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 TERAO1,2, Murat GEL2,3, Hiroki KOTAKE4, Atsuhito OKONOGI1,2,4, Teru OKITSU2,5, Takaaki SUZUKI1,2, Masao WASHIZU1,2, Hidetoshi KOTERA3,5
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 KAMIUCHI2, 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, Fujo 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, Kazuhiro TAKAHASHI, Masafumi HASHIMOTO
Doshisha University, Japan

P-BIO-04
REMARKS ON IMPROVEMENT OF MARKERLESS HUMAN MOTION CAPTURE FROM VOLUME RECONSTRUCTION
Ken UEDA, Kazuhiro TAKAHASHI, Masafumi HASHIMOTO
Doshisha University, Japan
Imaging and Printing Technologies

P-IMG-01
MULTI-OPTICAL BEAM ALIGNMENT SYSTEM FOR MICRO-PROJECTION
Jiro HASHIZUME1, Tomoki KOBORI1, Yoshihiko SEO2, Yasuhiro AMANO3, Etsuko NOMOTO4
1: Hitachi Ltd., Mechanical Engineering Research Laboratory, Japan
2: Hitachi Ltd., Consumer Electronics Laboratory, Japan
3: Hitachi Ltd., Production Engineering Research Laboratory, Japan
4: Hitachi Ltd., Central Research Laboratory, Japan

P-IMG-02
ANALYSIS OF NON-MAGNETIC SINGLE COMPONENT DEVELOPMENT SYSTEM IN ELECTROPHOTOGRAHY
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 ELECTROPHOTOGRAHY
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 UEYAMA1, 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 ULTRA-THIN 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 CONDITIONS
Yu TAMURA¹, Yasuhiro 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, Yasuhiro ANDO, Akihiro TANAKA, Koji MIYAKE, Atsushi KORENAGA
National Institute of Advanced Industrial Science and Technology (AIST), Japan

P-MNS-07
NANOTRANSFER METHOD FOR THE FERROELECTRIC FILMS ONTO THE POLYMER SUBSTRATE
Masaaki ICHIKI¹, Sho MAKINO¹, Tadamoto 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 DRIVE
Shigeo NAKAMURA, Shigeyuki SASAKI, Shigeo OHASHI
Hitachi Ltd., Japan

P-OPT-04
OPTIMAL DESIGN OF DYNAMIC VIBRATION ABSORBER USING L-SHAPED BEAM FOR
REDUCING OPTICAL DISK DRIVE VIBRATION
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2: Hitachi-LG Data Storage Inc., 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,
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