2015 JSME-IIP/ASME-ISPS Joint Conference on Micromechatronics for Information and Precision Equipment

June 14-17, 2015

Kobe International Conference Center, Kobe, Japan

Sponsored by

JSME Information, Intelligence and Precision (IIP) Equipment Division

ASME Information Storage and Processing Systems (ISPS) Division

Co-Organized by

JSME Micro-Nano Science and Technology Division

Map of Conference Venue

Conference Venue : Kobe International Conference Center 3F, 4F
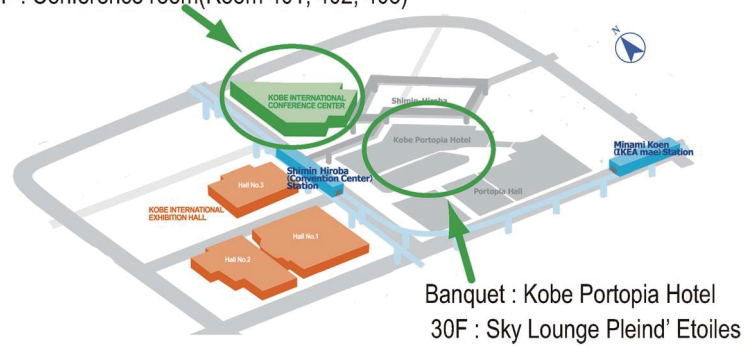
Banquet : Sky Lounge Plein d'Etoiles, KOBE PORTOPIA HOTEL Main Building 30F

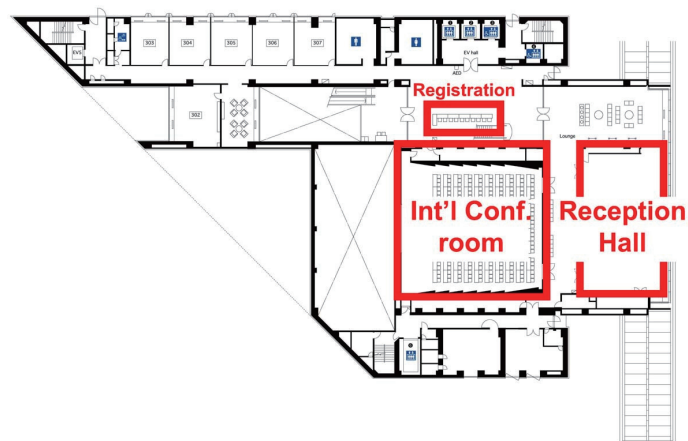Conference Venue : Kobe International Conference Center
3F : Registration,
    Conference room(Int'l Conf. room, Reception Hall)
4F : Conference room(Room 401, 402, 403)

Banquet : Kobe Portopia Hotel
30F : Sky Lounge Pleind' Etoiles

Kobe International Conference Center 3F (Int'l Conf. room, Reception Hall, Registration)

Kobe International Conference Center 4F (Room 401, Room 402, Room 403)

Forum

Technology Road Map Forum for Strategic Innovation by Exploration

Monday 15 June 13:30-16:10, Int'l Conf. room

Chair: Shintaro Itoh (Nagoya Univ.), Yoshihiro Tanaka (NITECH)

13:30-13:50 MoF-1
Technoloty roadmap of JSME IIP division -Positioning of each technology field and challenges-
Shozo Saegusa (Shujitsu Univ.)

For the purpose of the strategic positioning of Information Intelligent and precision engineering (IIP) division technologies of mechanical research area, technology roadmap (TRM) committee of IIP is organized. This paper is described the integrated perspective of the technology of IIP and shows challenges.

13:50-14:10 MoF-2
JSME-IIP division academic roadmap on information storage
Kenji Fukuzawa (Nagoya Univ.), Mitsuto Hirata (Utsunomiya Univ.), Shigeo Nakamura (HGST Japan), and Hiroshi Tani (Kansai Univ.)

Social needs for information storage are very high and will also be higher in the future. Needs for data storage are explosively increasing in cloud environment. A significant part of storage data are expected to be cold data with low-frequency access. Therefore, HDDs in position of in future storage systems are changing. The aim of this roadmap is to suggest the academic research fields needed for future HDDs and candidate fields where academic knowledge on HDDs can apply to. We focused on two key technologies for HDDs; positioning technologies and nano-tribology. Based on technology mapping of the technologies, roadmaps of the two technologies are discussed.

14:10-14:30 MoF-3
The future of flexible sheet media handling technology
Kazushi Yoshida (Hitachi-Omron Terminal Solutions, Corp.), Hiromu Hashimoto (Tokai Univ.), Shinji Hikita (Fujifilm Corporation), Shogo Matsumoto (Ricoh CO., Ltd.), Yuko Kobayashi (Toshiba Corp.), Yoshimitsu Goto (Asahi Kasei Corporation), and Yuta Sunami (Tokai Univ.)

We have considered what kind of technology will be needed in the future in the field of apparatus that handle flexible sheet media. As for the technology that handles cut sheet, it is about to enter a transitional period, and the development of a new technology that can handle various media (unlike the conventional cut sheet) with high reliability is required. As for the technology that handles consecutive media (web), in order to apply Roll-to-Roll (R2R) process to printed electronics (PE), the technology that can transport and wind thin web on which electric circuits and sensors formed is required.

14:30-14:50   **Coffee break**

14:50-15:10 MoF-4
Development of micro 3D printer and its future applications
Shinjiro Umezu (Waseda Univ.), and Hitoshi Ohmori (Riken)

3D printer was now applied to fabricate not only anime figures but also industrial products those were parts of vehicle and airplane. Actually, the machining accuracy is less than the ultraprecision machining's. However, relatively complex structures are easy to fabricate utilizing commercial 3D printer. In this paper, we would like to introduce the development of originally developed micro 3D printer and its future applications of biotechnology field and green technology field.

15:10-15:30 MoF-5

Evolution of motion-assist and rehabilitation systems for better human life
Kazuo Kiguchi (Kyushu Univ.)

Human motion-assist and rehabilitation systems such s orthoses, prostheses, human assist systems, etc. have been developed to make the human life better. Especially, the studies on the human assist systems such as power-assist robots and rehabilitation robots are actively performed in these days. Although simple motion generation systems such as CPM (continuous passive motion) systems are widely used for rehabilitation at present, rehabilitation robots are expected to realize more advanced rehabilitation. Many kinds of rehabilitation robots have been developed for upper-limb and lower-limb rehabilitation. Human motion-assist robots are also expected to help daily motion of physically weak persons. In this paper, state of the art technology of motion-assist and rehabilitation systems is explained and their future technology is prospected.

15:30-15:50 MoF-6

Towards the future of medical care (Medicine and engineering integration working group)
Mami Tanaka (Tohoku Univ.), Ken Masamune (Tokyo Women's Medical Univ.), Koichi Sagawa (Hirosaki Univ.), Yasuaki Otaki (Kanagawa Institute of Technology), and Yoshihiro Tanaka (Nagoya Institute of Technology)

With low birthrate and aging, staying healthy and the maintenance and improvement of the quality of life (QOL) are strongly desired. To stay healthy, early detection, treatment and recovery of diseases is important. In this paper, we report a trend of the recent medical equipment and what is demanded and how they advance in a future.

15:50-16:10 MoF-7

A road map for intelligent machines
Hiroshi Takahashi (Shonan Institute of Technology), Taichi Sato (Tokyo Denki Univ.), Akihiro Matsumoto (Toyo Univ.), Kenji Suzuki (Kogakuin Univ.), and Hiroshi Igarashi (Tokyo Denki Univ.)

Academic roadmap for intelligent machines came from the output of studying activities in Information, Intelligence and Precision Equipment Division of the Japan Society of Mechanical Engineers. Technology Trends on Intelligent machines to 2080 are explained.

Workshop

Frontier technologies leading advanced information society

Tuesday 16 June 13:30-17:05, Int'l Conf. room

Chair: Kenji Fukuzawa (Nagoya Univ.)

13:30-13:35
Opening address
Kenji Fukuzawa (Nagoya Univ.)

13:35-13:45
Recent activities of JSME-IIP division toward advanced information society
Akihiro Matsumoto (Toyo Univ.)

13:45-14:30 TuW-1
Towards a million TPI
Scott Abrahamson (Santa Clara Univ.) and Fu-ying Huang (HGST)

Within the circles of HDD researchers and developers significant focus has been on the next generation recording technology, as well as the economic pressure on the viability of HDDs from flash or solid state storage technology. The market share of flash storage has been gradually increasing for years, both in very high performance applications and in mobile applications. Among the strongest factors for continued use of HDDs in all applications are cost in $/TB and energy density in W/cc. Developers and researchers in solid state storage are making improvements in these areas as well.

Regardless of which next generation HDD recording technology you consider (HAMR, MAMR, or BPM), the increase in areal density will come largely from the ability to provide higher radial density than linear density. In other words, the TPI will increase more significantly that the BPI and the servomechanical design will have to improve dramatically to support these new recording technologies.

This talk will show how the traditional evolutionary approaches of internal disturbance reduction and controller enhancement will fall short when it comes to meeting the 1 MTPI challenge. This is largely due to the effects of external disturbances, which do not scale with track pitch. To reach the objective, we will need not only evolutionary changes, but we will increasingly rely on other active elements such as sensors and controller stages to enhance the effective bandwidth of the control system.

Additional sensors (or better use of current sensors) require improvements in signal to noise, or correlation between sensor signals and offtrack motion in order to cancel the effects of external disturbances. Because the market is sensitive not only to the cost per TB but also to the cost per HDD, and new recording technologies are expected to add to HDD cost, the use of more and/or more complex sensors carries an economic risk unless they can be added without increasing the overall HDD cost. As always with HDDs, the fundamental challenge of improving performance within the current range of production cost remains.

The assistance of HGST in the preparation of this talk is gratefully acknowledged

14:30-15:15 TuW-2
Recent advances of nanomaterials for printed electronics
K. Suganuma, M. Nogi, J. Jiu, H. Koga, T. Sugahara and S. Nagao (Osaka Univ.)

Printed electronics has been emerged as one of the key manufacturing processes for a wide variety of electronics products not only for home appliances but also for vehicles and for business-scale. The advances of nanomaterials, especially metallic and organic conductive materials, for printed electronics brought printed electronics into the reality. Sensing components by using metallic nanowires enable us to replace the conventional ITO transparent electrode to affordable, flexible, bendable, and even stretchable touch sensors. Wearable devices are another hot topic of printed electronics in the field of sports and fitness to healthcare. For wearable devices, not only wiring with metallic/organic materials, sensing, wireless transmission, and energy harvesting components must be equipped into a thin and flexible substrate with a suitable barrier structure. In the presentation, the current status of various nanomaterials for printed electronics sill be summarized with an introduction of attractive products.

15:15-15:30   **Coffee break**

15:30-16:15 TuW -3
Obstacle detection by stereo vision for collision avoidance
Keiji Saneyoshi (Tokyo Institute of Technology)

Recently Automatic Emergency Braking System has been put on the market by many companies to avoid collisions in a traffic environment. Intelligent sensors that not only detects the distances to obstacles, but acquires other relevant information, such as the areas occupied by the obstacles, the location of the traffic lanes, and the position and motion of other cars and pedestrians should be used for the system. Stereo vision is suitable for this application because of its wide field of vision, simultaneous detection of multiple objects, and ability to measure their sizes, positions, and relative velocities, as well as its ability to detect road shape and lane markings. Nevertheless, stereo vision also has several weak points such as the enormous amount of computation, the problem of mismatching and its vulnerability to the weather. We have overcome these problems through the use of several techniques: a new hardware system, precise rectification and proper exposure control. Our stereo vision system was first presented at the Tokyo Motor Show in 1991. At that time, the performance was 10 fps with a resolution area of 512 x 200 pixels and depth of 100 pixels. In 1999, the first on board stereo vision system for collision avoidance was put on the market. Recently, we developed a new stereo vision system that can detect pedestrian running out into the road immediately. In this talk, I will present obstacle detection technique using stereo vision system and their applications by demonstrations and videos.

16:15-17:00 TuW -4
Near-infrared spectroscopy measurement technique of brain activity and its application to human-machine interfaces
Keiichi Watanuki (Saitama Univ.)

Comfortableness of a ride is an important issue to improve the passenger experience in an automobile. It is affected by a variety of factors such as vibration, noise, and interior space. In particular, vibration comfortableness of a ride, attributed to the vibration of a running car, is one of the factors that affect the comfort of an automobile. Therefore, the level of vibration of a running car should be reduced as much as possible to improve comfortableness of a ride. However, it is difficult to quantify comfortableness of a ride because it is significantly affected by not only the performance of the car but also by passengers' emotions and physiology. Since the evaluation of ride comfort depends on a developer's subjective evaluation using his/her emotion evaluation, it is necessary to carry out sensory evaluations repeatedly to improve comfortableness of a ride. For more efficient development, objective evaluation methods of human emotion are needed to quantitatively evaluate comfortableness of a ride based on interaction science.

In recent years, the spread of noninvasive brain function measurement devices such as functional magnetic resonance imaging (fMRI) and near-infrared spectroscopy (NIRS) has allowed the measurement of brain activity during thinking or acting. NIRS is advantageous for its portability and fewer constraints on subjects. It allows measurement of a subject's brain functions while the subject is moving.

This presentation provides an interaction science and noninvasive brain function measurement using NIRS to examine brain activity during vibration. In the presentation, the comfort level is evaluated using the sensory evaluation as the subjective evaluation of vibration, and the brain activities are evaluated using NIRS for objective evaluation. Based on the analysis of brain-activity during the sensation of vibration, the relationship between vibrations, comfortableness of a ride and brain activity will be considered.

17:00-17:05
Closing Address
Kenji Fukuzawa (Nagoya Univ.)

Time Schedule

Sunday 14 June

15:00-17:00	Registration (Kobe International Conference Center 3F)

Monday 15 June

8:00-17:20	Registration (Kobe International Conference Center 3F)			
	Int'l Conf. room	**Room 401**	**Room 402**	**Room 403**
8:40- 8:55	Opening Ceremony (Int'l Conf. room)			
9:00-10:20	**MoA-1** Head/Media Interface and Tribology 1	**MoB-1** Micro/Nanomechatronics 1	**MoC-1** Flexible Media Handling Machines and Printed Elect & Imaging and Printing Technologies 1	**MoD-1** Servo Control 1
10:20-10:40	Coffee Break			
10:40-12:20	**MoA-2** Head/Media Interface and Tribology 2	**MoB-2** Micro/Nanomechatronics 2	**MoC-2** Flexible Media Handling Machines and Printed Elect & Imaging and Printing Technologies 2	**MoD-2** Servo Control 2
12:20-13:30	Lunch			
13:30-16:10	**MoF** Forum - Technology Road Map Forum for Strategic Innovation by Exploration- (Int'l Conf. room)			
16:10-17:20	**MoP** Poster Session (Reception Hall)			

Tuesday 16 June

8:00-17:05	Registration (Kobe International Conference Center 3F)			
	Int'l Conf. room	**Room 401**	**Room 402**	**Room 403**
8:40-10:20	**TuA-1** Head/Media Interface and Tribology 3	**TuB-1** Micro/Nanomechatronics 3	**TuC-1** Optical Storage and Optical Devices	**TuD-1** Bio-medical Equipment 1
10:20-10:40	Coffee break			
10:40-12:20	**TuA-2** Head/Media Interface and Tribology 4	**TuB-2** Drive Mechanism -Fluid bearings-	**TuC-2** Consumer Electronics	**TuD-2** Bio-medical Equipment 2
12:20-13:30	Lunch			
13:30-17:05	**TuW** Workshop - Frontier technologies leading advanced information society- (Int'l Conf. room)			
18:00-20:00	Banquet (Sky Lounge Plein d'Etoiles, KOBE PORTOPIA HOTEL)			

Wednesday 17 June

8:00-12:20	Registration (Kobe International Conference Center 3F)			
	Int'l Conf. room	**Room 401**	**Room 402**	**Room 403**
8:40-10:20	**WeA-1** Drive Mechanisms -Drive Performance-	**WeB-1** Simulation of Nanoscale Phenomena	**WeC-1** Precise Machining Process Technology 1	**WeD-1** Precision Equipments
10:20-10:40	Coffee break			
10:40-12:20	**WeA-2** Drive Mechanisms -S & V, Probe memory-	**WeB-2** Micro/Nanosystem Science and Technology 1	**WeC-2** Precise Machining Process Technology 2	**WeD-2** Intelligent Machines and Brain Science Applications 1
12:20-13:30	Lunch			
13:30-15:10	**WeA-3** Head/Media Interface and Tribology 5	**WeB-3** Micro/Nanosystem Science and Technology 2	**WeC-3** Sensor Networks and Wearable Information Devices 1	**WeD-3** Intelligent Machines and Brain Science Applications 2
15:10-15:30	Coffee break			
15:30-17:10	**WeA-4** Head/Media Interface and Tribology 6	**WeB-4** Micro/Nanosystem Science and Technology 3	**WeC-4** Sensor Networks and Wearable Information Devices 2	**WeD-4** Intelligent Machines and Brain Science Applications 3

Monday 15 June 9:00-10:20
MoA-1
Head/Media Interface and Tribology 1

Session Chair: Hiroshige Matsuoka (Tottori Univ.)
Masaru Furukawa (HGST)

9:00-9:20 MoA-1-1
Thermal response of a thermal asperity sensor to disk asperities
Youyi Fu (Univ. of California, San Diego), Chuanwei Zhang (Harbin Institute of Technology), and Frank E. Talke (Univ. of California, San Diego)

9:20-9:40 MoA-1-2
Temperature study of embedded contact sensor for HDDs
Masaru Furukawa, Junguo Xu, Jianhua Li, Kiyoshi Hishimoto, and Makoto Satou (HGST Japan, Ltd.)

9:40-10:00 MoA-1-3
Storage disk substrate effect on DC and AC responses of embedded contact sensor
Peng Peng, Michael Johnson, and Timothy Stoebe (Seagate Technology)

10:00-10:20 MoA-1-4
Effect of head-disk interface biasing on head wear of thermal flying height control sliders
Liane M. Matthes, Frederick E. Spada (Univ. of California, San Diego), Bernhard E. Knigge (WD, a Western Digital Company), and Frank E. Talke (Univ. of California, San Diego)

Monday 15 June 9:00-10:20
MoB-1
Micro/Nanomechatronics 1

Session Chair: Seiichi Hata (Nagoya Univ.)
Isaku Kanno (Kobe Univ.)

9:00-9:20 MoB-1-1
Comparison of novel reversed lift-off process with conventional lift-off process in cross-sectional shape on patterned structures
Shigetaka Watanabe, Junpei Sakurai, Mizue Mizoshiri, and Seiichi Hata (Nagoya Univ.)

9:20-9:40 MoB-1-2
Microscopic and macroscopic investigation of in vitro 3D-microvascular models under shear stress
Yasuhiro Yukawa (The Univ. of Tokyo), Toshiro Ohashi (Hokkaido Univ.), Beomjoon Kim, and Yukiko T. Matsunaga (The Univ. of Tokyo)

9:40-10:00 MoB-1-3
Research on the theory of acoustic levitation based on momentum exchange theory
Dong Huijuan, Guo Muduo, and Zhang Peng (Harbin Institute of Technology)

Monday 15 June 9:00-10:20
MoC-1
Flexible Media Handling Machines and Printed Elect & Imaging and Printing Technologies 1

Session Chair: Hiromu Hashimoto (Tokai Univ.)
James Chang (National Tsing Hua Univ.)

9:00-9:20 MoC-1-1
Measurement of internal stress distribution of wound roll in axial direction
Yuta Sunami, and Hiromu Hashimoto (Tokai Univ.)

9:20-9:40 MoC-1-2
Internal stress analysis of wound roll considering thermal-viscoelastic property and experimental verification
Hiromu Hashimoto, and Yuta Sunami (Tokai Univ.)

9:40-10:00 MoC-1-3
Optimization of winding condtions for preventing roll defects caused by thermal-viscoelastic property
Hiromu Hashimoto, and Yuta Sunami (Tokai Univ.)

10:00-10:20 MoC-1-4
Tribological characteristics between thin plastic film and steel roller
Yuta Sunami, and Hiromu Hashimoto (Tokai Univ.)

Monday 15 June 9:00-10:20
MoD-1
Servo Control 1

Session Chair: Takashi Yamaguchi (Ricoh Co. Ltd.)
Du Chunling (DSI)

9:00-9:20 MoD-1-1
Earliest switch-on of dual-stage actuation in hard disk drives
Bin Hu (Western Digital Technologies Inc. / National Univ. of Singapore), Chee Khiang Pang (National Univ. of Singapore), Jie Wan, Young-Hoon Kim, and Jern Khang Tan (Western Digital Technologies Inc.)

9:20-9:40 MoD-1-2
Time delay and sampling rate effect on dual-stage servo control performance
Chunling Du, Anmin Kong, and Yao Zhang (Data Storage Institute, A*STAR)

9:40-10:00 MoD-1-3
Improvement of convergence for adaptive feed-forward control by initial value setting in hard disk drives
Shota Yabui, and Takenori Atsumi (HGST Japan, Ltd.)

10:00-10:20 MoD-1-4
Discrete target trajectory design with sampled-data feedback control for high speed and high precision positioning of 1dof oscillator by using rotational vibration manipulation function
Shigeo Kotake (Mie Univ.)

Monday 15 June 10:40-12:20
MoA-2
Head/Media Interface and Tribology 2

Session Chair: Masaru Furukawa (HGST)
Hiroshige Matsuoka (Tottori Univ.)

10:40-11:00 MoA-2-1
Friction properties of nanometer-thick liquid lubricant films measured with dual-axis micromechanical probes
Takahiro Yoshimi, Hedong Zhang, Kenji Fukuzawa, and Shintaro Itoh (Nagoya Univ.)

11:00-11:20 MoA-2-2
Investigation of slider out-of-plane and in-plane vibrations during the track-seeking process
Wei Hua, Shengkai Yu, Weidong Zhou, and Kyaw Sett Myo (Data Storage Institute, A*STAR)

11:20-11:40 MoA-2-3
Dynamics of head-disk interface and mechanical components in hard disk drives during operational shock
Yu Shengkai, Mou Jianqiang, Hua Wei, Zhou Weidong, and Tan Chye Chin (Data Storage Institute, A*STAR)

11:40-12:00 MoA-2-4
Analysis of microwaviness-excited vibration of a flying head slider in asperity contact regime
Kyosuke Ono (Tokyo Institute of Technology)

12:00-12:20 MoA-2-5
Is no lube disk possible?
Huang Yuehua (Tsinghua Univ.), Lawrence Wah Ng (Fuji Electric(Malaysia) Sdn. Bhd.), and Meng Yonggang (Tsinghua Univ.)

Monday 15 June 10:40-12:20
MoB-2
Micro/Nanomechatronics 2

Session Chair: Seiichi Hata (Nagoya Univ.)
Isaku Kanno (Kobe Univ.)

10:40-11:00 MoB-2-1
Characteristics of Ti-Ni-Zr thin film metallic glasses for MEMS with three dimensional structure
Junpei Sakurai, Mizue Mizoshiri, and Seiichi Hata (Nagoya Univ.)

11:00-11:20 MoB-2-2
Reduction properties of nickel microstructures fabricated by direct femtosecond laser reduction patterning
Mizue Mizoshiri, Mizue Mizoshiri, Junpei Sakurai, and Seiichi Hata (Nagoya Univ.)

11:20-11:40 MoB-2-3
Reliability of vibration energy harvesters of PZT thin films on stainless steel cantilevers
Yuichi Tsujiura, Eisaku Suwa, Fumiya Kurokawa, Hirotaka Hida, and Isaku Kanno (Kobe Univ.)

11:40-12:00 MoB-2-4
Improvement of resolution in sec-type dna separation microchip by on-chip concentration using nano-slit
Naoki Azuma, Shintaro Itoh, Yusuke Sugimoto, Kenji Fukuzawa, and Hedong Zhang (Nagoya Univ.)

Monday 15 June 10:40-12:20
MoC-2
Flexible Media Handling Machines and Printed Elect & Imaging and Printing Technologies 2

Session Chair: Hiromu Hashimoto (Tokai Univ.)
Hiroyuki Kawamoto (Waseda Univ.)

10:40-11:00 MoC-2-1
Robust position measurement system for precision alignment of roll-to-roll printing using alignment patterns and quantity of light
Minkyu Jung, Hyungi Kim, and Dongho Oh (Chungnam National Univ.)

11:00-11:20 MoC-2-2
Feature of the overlap-type isolation mechanism of the paper sheets
Kazushi Yoshida (Hitachi-Omron Terminal Solutions, Corp.), and Toshifumi Mitsuyama (Hitachi, Ltd.)

11:20-11:40 MoC-2-3
Intelligence CGH for holographic 3D displays
Jang Hyun Kim, and Hyunseok Yang (Yonsei Univ.)

11:40-12:00 MoC-2-4
A sensing system of visual odometry and navigation using monocular vision sensor for mobile robot
Kazuki Itou, Pengcheng Zhang, and Jianming Yang (Meijo Univ.)

Monday 15 June 10:40-12:20
MoD-2
Servo Control 2

Session Chair: Du Chunling (DSI)
Takashi Yamaguchi (Ricoh Co. Ltd.)

10:40-11:00 MoD-2-1
State estimate-based adaptive fuzzy control of active slider in touchdown
Yongfu Wang (Northeastern Univ.), Gang Sheng Chen (Marshall Univ.), Shengkai Yu, and Wei Hua (Data Storage Institute, A*STAR)

11:00-11:20 MoD-2-2
Storage and reproduction of environmental haptic sensations considering resolution of encoder
Yusuke Asai, Yuki Yokokura, and Kiyoshi Ohishi (Nagaoka Univ. of Technology)

11:20-11:40 MoD-2-3
Robust motion control using Kalman-filter-based instantaneous state observer for industrial robot
Akinori Yabuki, Takashi Yoshioka, Thao Tran Phuong, Kiyoshi Ohishi, Toshimasa Miyazaki, and Yuki Yokokura (Nagaoka Univ. of Technology)

Tuesday 16 June 8:40-10:20
TuA-1
Head/Media Interface and Tribology 3

Session Chair: Frank E. Talke (Univ. of California, San Diego)
Takayuki Yamamoto (Western Digital)

8:40-9:00 TuA-1-1
In-situ observation of HDD media degradation on laser heating for heat-assisted magnetic recording
Masahiro Yanagisawa, Masahiro Kunimoto, and Takayuki Homma (Waseda Univ.)

9:00-9:20 TuA-1-2
Investigations of lubricant depletion in HAMR system using molecular dynamics simulation
Deng Pan, and Xiaowen Qi (Yanshan Univ.)

9:20-9:40 TuA-1-3
Thermal decomposition of ultra-thin PFPE analyzed by TOF-SIMS
Hiroaki Asada, Hiroshi Tani, Shinji Koganezawa, and Norio Tagawa (Kansai Univ.)

9:40-10:00 TuA-1-4
Analysis of lubricant loss of a HAMR slider under a heat source at head disk interface in hard disk drives
Hongrui Ao, Kai Zhang, Ming Dong, and Hongyuan Jiang (Harbin Institute of Technology)

10:00-10:20 TuA-1-5
Recovery characteristics of lubricant film at head disk interface for a HAMR slider in hard disk drives
Hongrui Ao, Zhiying Han, Ming Dong, and Hongyuan Jiang (Harbin Institute of Technology)

Tuesday 16 June 8:40-10:20
TuB-1
Micro/Nanomechatronics 3

Session Chair: Junpei Sakurai (Nagoya Univ.)
Manabu Yasui (Kanagawa Industrial Tech. Research Inst.)

8:40-9:00 TuB-1-1
Design principle of micro-mechanical probe for lateral-deflection-controlled friction force microscopy
Kenji Fukuzawa, Satoshi Hamaoka (Nagoya Univ.), Mitsuhiro Shikida (Hiroshima City Univ.), Shintaro Itoh, and Hedong Zhang (Nagoya Univ.)

9:00-9:20 TuB-1-2
Development of simple microrobot using piezoelectric thin film actuator on metal substrate
Hirotaka Hida, Yuki Morita, Fumiya Kurokawa, Yuichi Tsujiura, and Isaku Kanno (Kobe Univ.)

9:20-9:40 TuB-1-3
The relationship between micro spikes on dragonfly wing and pressure drag
Naoyuki Tanabe, Hisayoshi Naka, and Hiromu Hashimoto (Tokai Univ.)

Tuesday 16 June 8:40-10:20
TuC-1
Optical Storage and Optical Devices

Session Chair: : No-Cheol Park (Yonsei Univ.)

8:40-9:00 TuC-1-1
Optimized aberration compensation for digital holography using dual mask
Sungbin Jeon, Do-Hyung Kim, Geon Lim, and No-Cheol Park (Yonsei Univ.)

9:00-9:20 TuC-1-2
Effective design of image filter based on the selective frequency analysis to improve the bit error rate in holographic data storage systems
Hwal Kim, Sungbin Jeon, Janghyun Cho, Do-Hyung Kim, and No-Cheol Park (Yonsei Univ.)

9:20-9:40 TuC-1-3
White uniform flexible light-emitting diodes
Chin-Wei Sher (National Chiao Tung Univ. / National Tsing Hua Univ.), Kuo-Ju Chen, Hau-Vei Han, Huang-Yu Lin (National Chiao Tung Univ.), Chien-Chung Lin (National Tsing Hua Univ.), Zong-Yi Tu, Hsien-Hao Tu (National Chiao Tung Univ.), Chien-Chung Fu (National Tsing Hua Univ.), and Hao-Chung Kuo (National Chiao Tung Univ.)

9:40-10:00 TuC-1-4
Noise reduction method using extended kalman filter for tilt servo control in holographic data storage system
Jang Hyun Kim, and Hyunseok Yang (Yonsei Univ.)

Tuesday 16 June 8:40-10:20
TuD-1
Bio-medical Equipment 1

Session Chair: Koichi Sagawa (Hirosaki univ.)
Yasuaki Ohtaki (Kanagawa Institute of Technology)

8:40-9:00 TuD-1-1
Measurement of viscoelastic properties of the grasped objects by a grasping forceps with sensors
Rintaro Goto (Tokyo Denki Univ.), Akihito Nakai (The Univ. of Tokyo / Touchence Inc.), Ken Masamune (Tokyo Women's Medical Univ.), Takeyoshi Dohi, and Kenta Kuwana (Tokyo Denki Univ.)

9:00-9:20 TuD-1-2
Study on a tactile sensor that detects both of contact position and force using acoustic reflection
Tomohiro Fukuda, Yoshihiro Tanaka (Nagoya Institute of Technology), Michitaka Fujiwara (Nagoya Univ.), and Akihito Sano (Nagoya Institute of Technology)

9:20-9:40 TuD-1-3
Measurement of palpation motion using prostate examination simulator and motion capture system
Takeshi Okuyama, Shota Yokoyama, Yoshikatsu Tanahashi, and Mami Tanaka (Tohoku Univ.)

9:40-10:00 TuD-1-4
Usability evaluation of compact braille reading sensor
Mami Tanaka, Asuka Sakaguchi, and Takeshi Okuyama (Tohoku Univ.)

10:00-10:20 TuD-1-5
Design of a dorsal man-machine interaction device for the supporting leg control of the HIT-exoskeleton
Chao Zhang, and Yanhe Zhu (Harbin Institute of Technology)

Tuesday 16 June 10:40-12:20
TuA-2
Head/Media Interface and Tribology 4

Session Chair: Takayuki Yamamoto (Western Digital)
Frank E. Talke (Univ. of California, San Diego)

10:40-11:00 TuA-2-1
A new test experimental set-up for studying the head/disk interface in heat assisted magnetic recording using tip-enhanced Raman spectroscopy
Longqiu Li (Univ. of California, San Diego / Harbin Institute of Technology), Benjamin Suen, Young Seo (Univ. of California, San Diego), Andrew King (Renishaw Inc.), and Frank E. Talke (Univ. of California, San Diego)

11:00-11:20 TuA-2-2
Study of PFPE lubricants with multidentate functional groups on magnetic disk surface
Tsuyoshi Shimizu (MORESCO Corporation), and Hiroshi Tani (Kansai Univ.)

11:20-11:40 TuA-2-3
Experimental and numerical investigation of hydrocarbon transfer mechanism at the head-disk interface
Young Woo Seo, and Frank E. Talke (CMRR, Univ. of California)

11:40-12:00 TuA-2-4
Effects of additives and deep UV irradiation on magnetic hard disk to wear on magnetic head
Wah, Lawrence Ng (Fuji Electric (Malaysia) Sdn. Bhd. / Tsinghua Univ.), Nimura Kazuo (Fuji Electric (Malaysia) Sdn. Bhd.), and Yonggang Meng (Tsinghua Univ.)

12:00-12:20 TuA-2-5
Morphology of nanometer lubricant film and head contact behavior by molecular dynamics simulation
Yoko Saito (HGST Japan, a Western Digital company), Robert Waltman (HGST, a Western Digital company), and Hiroyuki Matsumoto (HGST Japan, a Western Digital company)

Tuesday 16 June 10:40-12:20
TuB-2
Drive Mechanisms -Fluid bearings-

Session Chair: Keiji Aruga (ARC)
Yasushi Tomizawa (Toshiba Corporation)

10:40-11:00 TuB-2-1
Robust shaft design against shaft deformation in hub press-fitting and disk clamping processes of a 2.5" HDD
Bumcho Kim (Hanyang Univ. / Samsung Electro-Mechanics Co.), and Gunhee Jang (Hanyang Univ.)

11:00-11:20 TuB-2-2
Behavior of air-oil interface in the FDBs with double sealing structure in a 2.5" HDD due to non-operating axial shock
Chiho Kang, Yeonha Jung, Jihoon Lee, Minho Lee, Bumcho Kim, and Gunhee Jang (Hanyang Univ.)

11:20-11:40 TuB-2-3
Prediction of the oil injection time of the FDBs in the HDD spindle motor with tied shaft by utilizing the kirchhoff's pressure law
Minho Lee, Jihoon Lee, Chiho Kang, Kyobong Kim, Hokyung Jang, and Gunhee Jang (Hanyang Univ.)

11:40-12:00 TuB-2-4
Development of air bearing spindle motor for hard disk drives
Kei Harada, Masayuki Ochiai, Yuta Sunami, and Hiromu Hashimoto (Tokai Univ.)

12:00-12:20 TuB-2-5
Flow visualization and velocity field measurement inside a refractive-index matched transparent model of a hard disk drive
Shohei Ishimura, Katsuaki Shirai, Ryo Tada, Tsuyoshi Kawanami, and Shigeki Hirasawa (Kobe Univ.)

Tuesday 16 June 10:40-12:20
TuC-2
Consumer Electronics

Session Chair: Taichi Sato (Tokyo Denki Univ.)
Hiroki Ota (Hitachi Appliance, Inc.)

10:40-11:00 TuC-2-1
Analysis of cover thickness parameters influence on multilayer ceramic capacitor vibration
Byung-Han Ko (Yonsei Univ.), Heungkil Park (Samsung Electro-mechanics), Young-Pil Park, and No-Cheol Park (Yonsei Univ.)

11:00-11:20 TuC-2-2
Analysis on high-pitched noise generated from the solid state drive
Dongjoon Kim, No-Cheol Park, and Young-Pil Park (Yonsei Univ.)

11:20-11:40 TuC-2-3
UMF and cogging torque of PM motors due to the interaction between PM magnetization and stator eccentricity
Bosung Seo, Sangjin Sung, Kyungjin Kang, Jeongyong Song, and Gunhee Jang (Hanyang Univ.)

11:40-12:00 TuC-2-4
Aerodynamic excitation force generated by rotating fan and its reaction forces
Shusaku Niita, Taichi Sato (Tokyo Denki Univ.), Hiroki Ota, and Katsuaki Nagahashi (Hitachi Appliances Inc.)

12:00-12:20 TuC-2-5
Study on influence of tip vortex on aerodynamic noise of half-ducted propeller fans for packaged air-conditioner
Taku Iwase (Hitachi, Ltd.), and Tetsushi Kishitani (Hitachi Appliances, Inc.)

Tuesday 16 June 10:40-12:20
TuD-2
Bio-medical Equipment 2

Session Chair: Yoshihiro Tanaka (Nagoya Institute
of Technology)
Takeshi Okuyama(Tohoku Univ.)

10:40-11:00 TuD-2-1
Readout of a sensor for melanin evaluation and blood pressure measurement
Kai-Yu Shao, Sheng-Chieh Huang, Trong-Hieu Tran, Pei-Yu Chiang, and Paul C.-P. Chao (National Chiao Tung Univ.)

11:00-11:20 TuD-2-2
A novel 3D solid-fluid-electric finite element model with cuffless strain blood pressure sensor
Yung-Hua Kao, Tse-Yi Tu, and Paul C.-P. Chao (National Chiao Tung Univ.)

11:20-11:40 TuD-2-3
Characterization of patellar tendon reflex utilizing portable instrument
Yasuaki Ohtaki (Kanagawa Institute of Technology), and Naotaka Mamizuka (Oita Seikeigeka Hospital)

11:40-12:00 TuD-2-4
Flexible coaxial laser endoscope system for photodynamic therapy of cancer
Yan Hu (The Univ. of Tokyo), and Ken Masamune (Tokyo Women's Medical Univ.)

12:00-12:20 TuD-2-5
Error analysis of the surgical robot with novel positioning mechanism for oral and maxillofacial surgery
Kazuaki Hara (The Univ. of Tokyo), Hideyuki Suenaga (The Univ. of Tokyo Hospital), and Ken Masamune (Tokyo Women's Medical Univ.)

Wednesday 17 June 8:40-10:20
WeA-1
Drive Mechanisms -Drive Performance-

Session Chair: Shigeo Nakamura (HGST Japan)
Tatsuhiko Nishida (NHK SPRING CO.,LTD.)

8:40-9:00 WeA-1-1
On relationship of natural frequency, damping, and feedforward acceleration with transient vibration of track-seek control
Takehiko Eguchi (HGST Japan, Ltd.)

9:00-9:20 WeA-1-2
Performance measurement of a new type chassis
Qide Zhang, Cheng-Peng Tan, Zhi-Yong Ching, and Chye-Chin Tan (Data Storage Institute, A*STAR)

9:20-9:40 WeA-1-3
Nonlinear effects of PZT micro-actuator in hard disk drives with multi-rate digital controller
Keiji Aruga (Aruga Research LLC)

Wednesday 17 June 8:40-10:20
WeB-1
Simulation of Nanoscale Phenomena

Session Chair: Kenji Fukuzawa (Nagoya Univ.)
Hitoshi Washizu (Toyota Central R&D Labs.)

8:40-9:00 WeB-1-1
Molecular dynamics simulations of diffusion of submonolayer polar liquid lubricant films on solid surfaces
Takayuki Kobayashi, Hedong Zhang, Kenji Fukuzawa, and Shintaro Itoh (Nagoya Univ.)

9:00-9:20 WeB-1-2
Structure and dynamics of polyelectrolyte brushes calculated by coarse-grained molecular simulations
Hitoshi Washizu, Tomoyuki Kinjo, and Hiroaki Yoshida (Toyota Central R&D Labs., Inc. / ESICB, Kyoto Univ.)

9:20-9:40 WeB-1-3
Nanotribology on resin/metal interface: A computational chemistry approach
Tasuku Onodera, Kenji Kawasaki, Takayuki Nakakawaji (Hitachi Ltd., Hitachi Research Laboratory), Yuji Higuchi, Nobuki Ozawa, Kazue Kurihara, and Momoji Kubo (Tohoku Univ.)

9:40-10:00 WeB-1-4
Atomic-scale control of friction and energy dissipation at superlubric carbon interfaces
Naruo Sasaki (The Univ. of Electro-Communications), Sho Imamura, Noriaki Itamura (Seikei Univ.), Masaru Suzuki (The Univ. of Electro-Communications), and Kouji Miura (Aichi Univ. of Education)

10:00-10:20 WeB-1-5
Atomistic friction phase diagram and non-linear dynamical effects in dynamic frictional energy dissipation
Motohisa Hirano (Hosei Univ.)

Wednesday 17 June 8:40-10:20
WeC-1
Precise Machining Process Technology 1

Session Chair: Kazuyuki Tadatomo (Yamaguchi Univ.)

8:40-9:00 WeC-1-1
Predicting periodic evolution of BUE formation mechanisms during machining ductile material using damage mechanics
Xiaoqi Song (Chuo Univ.), Weiming He (Univ. of Shanghai for Science and Technology), and Tohru Ihara (Chuo Univ.)

9:00-9:20 WeC-1-2
Robotic CAM system to efficiently remove cusp marks along curved surface
Fusaomi Nagata, Shohei Hayashi, Tomoya Nagatomi, Akimasa Otsuka (Tokyo Univ. of Science, Yamaguchi), and Keigo Watanabe (Okayama Univ.)

9:20-9:40 WeC-1-3
An improvement of ICP algorithm using hough transform
Yuhi Yoshida (Yokohama National Univ.), Seungki Kim (The Univ. of Tokyo), Yusuke Imai (Chuo Univ.), Kentaro Shida, Hiroshi Tadenuma, and Hiroshi Kawaharada (Yokohama National Univ.)

9:40-10:00 WeC-1-4
Design and development of multi-scale product design system
Kazuhiro Sakita (Freelance)

Wednesday 17 June 8:40-10:20
WeD-1
Precision Equipments

Session Chair: Tadahiko Shinshi (Tokyo Institute of Technology)

8:40-9:00 WeD-1-1
Investigating the characteristics of tri-switches probing heads for micro-CMM
Kuo-Yu Tseng, and Dong-Yea Sheu (National Taipei Univ. of Technology)

9:00-9:20 WeD-1-2
Development of magnetically suspended double-layered cylinder with 1-DOF active positioning control
Junichi Asama, Hirotaka Suzuki, and Takaaki Oiwa (Shizuoka Univ.)

9:20-9:40 WeD-1-3
A development of an automated focusing method for a parallel micro-manipulator alignment
Zheng Yuan Li (Sungkyunkwan Univ.), Yong Seok Ihn (Korea Institute of Science and Technology), Kyeong Ha Lee, Jae Hyeon Kim, Jae Young Choi, Hae Jin Lee, Hyun Sok Yoon, Hyo Ju Lee, Hyuk Jin Lee, and Ja Choon Koo (Sungkyunkwan Univ.)

9:40-10:00 WeD-1-4
Dielectric driving device for superconducting filter tuning
Rie Katsuki, Hiroshi Takahashi, Junya Tanaka, Toshikatsu Akiba, Hiroaki Ikeuchi, Hiroyuki Kayano, Noritsugu Shiokawa, and Tamio Kawaguchi (Toshiba Corporation)

10:00-10:20 WeD-1-5
Dynamic experiments of asymmetric arms on the Delta robot system

Tsung-Liang Wu (National Kaohsiung First Univ. Science and Technology), Jih-Hsiang Yeh, and Yu-tsung Chiu (Industrial Technology Research Institute)

Wednesday 17 June 10:40-12:20
WeA-2
Drive Mechanisms -S & V, Probe memory-

Session Chair: Shinji Koganezawa (Kansai Univ.)
Yasushi Tomizawa (Toshiba Corporation)

10:40-11:00 WeA-2-1
Shock and vibration analysis of a data storage system
Lidu Huang, David Niss, Jeff Wilke, and Toshiki Hirano (HGST, a Western Digital Compamy)

11:00-11:20 WeA-2-2
Experimental and numerical studies for operational shock of hard disk drives
Tatsuhiko Nishida, Masao Hanya, Toshiki Ando, and Zhu Ding (NHK SPRING CO., LTD.)

11:20-11:40 WeA-2-3
Fundamental studies of the sliding system for probe-based archive memories
Yasushi Tomizawa, Kiminori Toya, Atsuro Oonishi, Yongfang Li, Jun Hirota, Moto Yabuki, Iwao Kunishima, and Hideo Shinomiya (Toshiba Corporation)

11:40-12:00 WeA-2-4
Highly precise positioning X-Y stage for scanning prove microscopy
Akira Sakurada, Ryo Arakawa, Shigeki Mori (Akita Industrial Technology Center), Akihiro Naganawa, Yotsugi Shibuya (Akita Univ.), and Goro Obinata (Chubu Univ.)

12:00-12:20 WeA-2-5
Real-time observation setup of single nano-asperity friction
Takaaki Sato (Tokyo Univ.), Laurent Jalabert, Yuki Takayama (LIMMS/CNRS-IIS, The Unversity of Tokyo), and Hiroyuki Fujita (The Unversity of Tokyo)

Wednesday 17 June 10:40-12:20
WeB-2
Micro/Nanosystem Science and Technology 1

Session Chair: Yasuhisa Ando (Tokyo Univ. of Agriculture and Technology)
Jun Hirota (Toshiba Corporation)

10:40-11:00 WeB-2-1
Feasibility of energy harvesting using vertical bi-stable cantilever with tip mass based on stochastic resonance
Michitaka Kawano, Yunshun Zhang, Rencheng Zheng, Kimihiko Nakano, and Beomjoon Kim (The Univ. of Tokyo)

11:00-11:20 WeB-2-2
Bubble propelled tubular mesostructur silica/metal micromotor
Dekai Zhou, Wenping Song, Jing Qiao, Guangyu Zhang, and Longqiu Li (Harbin Institute of Technology)

11:20-11:40 WeB-2-3
A study on the influence of disk curvature under operational shock condition for a 2.5 inch HDD
Geonyup Lim, No-Cheol Park (Yonsei Univ.), Younghyun Lee, Young Bae Chang, and Cheol-soon Kim (Seagate Korea Design Center)

11:40-12:00 WeB-2-4
Development of evanescent laser doppler measurement system for characterizing nanoscale interfacial flows
Katsuaki Shirai, Tsuyoshi Kawanami, and Shigeki Hirasawa (Kobe Univ.)

Wednesday 17 June 10:40-12:20
WeC-2
Precise Machining Process Technology 2

Session Chair: Michio Uneda (Kanazawa Institute of Technology)

10:40-11:00 WeC-2-1
Transmission electron microscopy study on origin of threading dislocations in GaN layer grown on patterned sapphire substrate
Tohoru Matsubara (Yamaguchi Univ. / UBE Scientific Analysis Laboratory, Inc.), Kohei Sugimoto, Narihito Okada, and Kazuyuki Tadatomo (Yamaguchi Univ.)

11:00-11:20 WeC-2-2
Influence of linear velocity ratio on removal rate of sapphire-chemical mechanical polishing
Michio Uneda, Keiichi Takano (Kanazawa Institute of Technology), Koji Koyama, Hideo Aida (Namiki Precision Jewel Co. Ltd.), and Ken-ichi Ishikawa (Kanazawa Institute of Technology)

11:20-11:40 WeC-2-3
Development of innovative dilatancy pad and high-speed / high-pressure polishing machine aimed for high-efficient and high-quality processing of next generation semiconductor substrates
Tsutomu Yamazaki, Kiyoshi Seshimo, Hideaki Nishizawa, Masanori Ohtsubo (Kyushu Univ.), Hideo Aida (NAMIKI PRECISION JEWEL CO., LTD.), Tadakazu Miyashita (Fujikoshi Machinery Corp.), Masataka Takagi (Fujibo Ehime CO., LTD.), and Toshiro K. Doi (Kyushu Univ.)

11:40-12:00 WeC-2-4
Plasma fusion chemical mechanical polishing of ultra-hard-to-process materials -Basic process characteristics for GaN substrate and prospective application toward diamond substrate-
Koki Oyama (Namiki Precision Jewel Co., Ltd. / Kyushu Univ.), Toshiro K. Doi (Kyushu Univ.), Yasuhisa Sano (Osaka Univ.), Syuhei Kurokawa (Kyushu Univ.), Hideo Aida, Seongwoo Kim (Namiki Precision Jewel Co., Ltd.), Hideaki Nishizawa, Chengwo Wong (Kyushu Univ.), and Tadakazu Miyashita (Fujikoshi Machinery Corp.)

12:00-12:20 WeC-2-5
High-efficiency planarization method for hard-to-machine semiconductor substrates combining mechanical polishing and atmospheric-pressure plasma etching
Yasuhisa Sano, Kousuke Shiozawa (Osaka Univ.), Toshiro Doi, Syuhei Kurokawa (Kyushu Univ.), Hideo Aida (Namiki Precision Jewel Co., Ltd.), Tadakazu Miyashita (Fujikoshi Machinery Corp.), and Kazuto Yamauchi (Osaka Univ.)

Wednesday 17 June 10:40-12:20
WeD-2
Intelligent Machines and Brain Science Applications 1

Session Chair: Hiroshi Takahashi (Shonan Inst. Tech.)
Katsuaki Shirai (Kobe Univ.)

10:40-11:00 WeD-2-1
A pin-matrix type tactile mouse for virtual smooth surface like-velvet in the human's hand
Nader Rajaei, Hironaga Nomura, Syojiro Matsushita, Masahiro Ohka (Nagoya Univ.), and Tetsu Miyaoka (Shizuoka Institute of Science & Technology)

11:00-11:20 WeD-2-2
Estimation of velvet hand illusion sensitivity variation using tactile display and paired comparison method
Shojiro Matsushita, Hironaga Nomura, Nader Rajaei, Masahiro Ohka (Nagoya Univ.), and Tetsu Miyaoka (Shizuoka Institute of Science and Technology)

11:20-11:40 WeD-2-3
String-based 3-DOF haptic tablet device with control method based on human haptic adaptation
Shin Norieda, Yosuke Takano (NEC Corporation), and Makoto Sato (Tokyo Institute of Technology)

11:40-12:00 WeD-2-4
EMG signal analysis of facial muscles in speaking words of foreign language from the viewpoint of skill acquisition
Akihiro Matsumoto (Toyo Univ.)

Wednesday 17 June 13:30-15:10
WeA-3
Head/Media Interface and Tribology 5

Session Chair: Hedong Zhang (Nagoya Univ.)
Koji Sonoda (Toshiba)

13:30-13:50 WeA-3-1
Stiffness and damping evaluation of air-bearing slider in the near-contact region
Jun-ichi Ichihara (Rocin Mechanics Research)

13:50-14:10 WeA-3-2
Nonlineaer stochastic dynamics of nano-scale active air-bearing slider
Gang Sheng Chen (Marshall Univ.), Wei Hua, Shengkai Yu (Data Storage Institute, A*STAR), and Y. F. Wang (Northeastern Univ.)

14:10-14:30 WeA-3-3
Dual track wallace fly height measurement method to monitor slider motion in 2 dimension at near contact regime
Chun Lian Ong, Siang Huei Leong, Shiming Ang, Budi Santoso, and Zhimin Yuan (Data Storage Institue, A*STAR)

14:30-14:50 WeA-3-4
Ambient pressure effect on touch-down/take-off of air bearing slider in head/disk interface
B. J. Shi, Y. R. Sun (Shandong Jianzhu Univ.), J. D. Ji (Shandong Univ. / Shandong Jianzhu Univ.), Z. L. Wang, and Y. M. Zhang (Shandong Jianzhu Univ.)

14:50-15:10 WeA-3-5
A study on head/tape spacing of barium ferrite magnetic tape media
Eiki Ozawa, Yuichi Kurihashi, and Osamu Shimizu (Recording Media Research Laboratories, FUJIFILM Corporation)

Wednesday 17 June 13:30-15:10
WeB-3
Micro/Nanosystem Science and Technology 2

Session Chair: Koji Miyake (AIST)
Hiromu Hashimoto (Tokai Univ.)

13:30-13:50 WeB-3-1
Friction properties of nanostripe structures in vacuum environment
Shunsuke Abe, and Yasuhisa Ando (Tokyo Univ. of Agriculture and Technology)

13:50-14:10 WeB-3-2
Tribological system with a grooved antiwear probe and oil lubrication for sliding electric contact stability
Jun Hirota, Yasushi Tomizawa, Kiminori Toya, Atsuro Oonishi, Yongfang Li, Moto Yabuki, and Hideo Shinomiya (Toshiba Corporation)

14:10-14:30 WeB-3-3
High resistance to carbon fiber pull-out generated by huge friction force of universal metal /metal joint
Masataka Tomizawa, Shigehito Inui, Kazuma Shiraishi, Noriyoshi Miwa, Michael C. Faudree, Yoshihito Matsumura, Itaru Jimbo, and Yoshitake Nishi (Tokai Univ.)

14:30-14:50 WeB-3-4
Adhesion of lamination joint of austenite stainless steel and CFRP treated by homogeneous low energy electron beam irradiation (HLEBI) prior to hot-press
Akiko Minegishi, Takumi Okada, Masae Kanda, Itaru Zinbo, and Yoshitake Nishi (Tokai Univ.)

14:50-15:10 WeB-3-5
Effects of homogeneous electron beam irradiation on adhesion force of PTFE/PDMS
Arata Yagi, Chisato Kubo, Masato Uyama, Masae Kanda, Itaru Jimbo, and Yoshitake Nishi (Tokai Univ.)

Wednesday 17 June 13:30-15:10
WeC-3
Sensor Networks and Wearable Information Devices 1

Session Chair: Shin'ichi Warisawa (The Univ. of Tokyo)
Yoshihiro Tanaka (Nagoya Institute of Technology)

13:30-13:50 WeC-3-1
Effect of direct neck cooling on psychological and physiological state
Guillaume Lopez, Yuta Suzuki (Aoyama Gakuin Univ.), Yasuhiro Kawahara (The Open Univ. of Japan), Mikio Takahashi, and Hiroki Takahashi (Takenaka Corporation)

13:50-14:10 WeC-3-2
Future power powering future: High-performance triboelectric nanogenerator for wearable electronics

Xiao-Sheng Zhang (The Univ. of Tokyo / EPFL), Beomjoon Kim (The Univ. of Tokyo), and Jürgen Brugger (EPFL)

14:10-14:30 WeC-3-3
Numerical study on residual magnetic field of underground pipe with corrosion damage
Wenping Song, Longqiu Li, Jiangna Jiao, Hongtao Zhang, Dekai Zhou, and Wuyi Wang (Harbin Institute of Technology)

Wednesday 17 June 13:30-15:10
WeD-3
Intelligent Machines and Brain Science Applications 2

Session Chair: Akihiro Matsumoto (Toyo Univ.)
Hiroshi Igarashi (Tokyo Denki Univ.)

13:30-13:50 WeD-3-1
Prediction of user's motion intention in perception-assist for a lower-limb power-assist exoskeleton robot - ZMP-based prediction -
Kazuo Kiguchi, and Akito Arai (Kyushu Univ.)

13:50-14:10 WeD-3-2
Evolving adaptive behavior for ubot modular self-reconfigurable robot
Jie Zhao, Xiaolu Wang, Dongyang Bie, Sajid Iqbal, and Yanhe Zhu (Harbin Institute of Technology)

14:10-14:30 WeD-3-3
Development of a new velocity calibration method for laser velocimetry towards achieving small measurement uncertainty
Katsuaki Shirai, Shohei Ishimura, Tsuyoshi Kawanami, and Shigeki Hirasawa (Kobe Univ.)

14:30-14:50 WeD-3-4
Measurement and evaluation of crutch walk motions by Kinect sensor
Naoaki Tsuda, Hiroumi Funatsu, Noboru Ise (National Institute of Technology,Wakayama College), Yoshihiko Nomura, and Norihiko Kato (Mie Univ.)

14:50-15:10 WeD-3-5
Modeling of lithium-ion capacitor and its charging and discharging circuit in model based design approach
Kyoji Nakajo, Shinji Aoki, Takashi Yatsuda, Shuji Takahashi, Kazuhiro Motegi (Gunma Univ.), Yasuhiro Kobayashi (Realize Computer Engineering Co., ltd.), and Yoichi Shiraishi (Gunma Univ. / Realize Computer Engineering Co., ltd.)

Wednesday 17 June 15:30-17:10
WeA-4
Head/Media Interface and Tribology 6

Session Chair: Koji Sonoda (Toshiba)
Hedong Zhang (Nagoya Univ.)

15:30-15:50 WeA-4-1
Siloxane formation in disk drives of current generation
Paul H. Kasai (MORESCO Corp.), and Vedantham Raman (HGST)

15:50-16:10 WeA-4-2
Effects to head wear performance of lubricant coverage of hard disk in ultra-thin lubricant
Ichiro Ota, Hiroyuki Tomita, and Katsumi Murofushi (Showa Denko K.K.)

16:10-16:30 WeA-4-3
Reduction of lubricant pickup by bias voltage between slider and disk surfaces
Hiroshi Tani, Shinji Koganezawa, and Norio Tagawa (Kansai Univ.)

16:30-16:50 WeA-4-4
Hydrocarbon contamination in disk drives : Issues and potenttial remedies
Vedantham Raman, Thomas Nguyen, and Jorge Escobar (HGST)

Wednesday 17 June 15:30-17:10
WeB-4
Micro/Nanosystem Science and Technology 3

Session Chair: Katsuaki Shirai (Kobe Univ.)
Yasushi Tomizawa (Toshiba Corporation)

15:30-15:50 WeB-4-1
EB - irradiation induced strengthening and reproducibly of CFRTP
Ryo Nomura, Masae Kanda, Hiroaki Takei, Keisuke Iwata, Itaru Jimbo (Tokai Univ.), Michelle Salvia (Ecole Centrale de Lyon), Michael Faudree, and Yoshitake Nishi (Tokai Univ.)

15:50-16:10 WeB-4-2
Tensile strength of metal/CFRP joint reinforced by carbon fibers
Hitoki Hasegawa, Shigehito Inui, Kazuma Shiraishi, Sho Ishii, Noriyoshi Miwa, Keisuke Iwata, Itaru Jinbo, and Yoshitake Nishi (Tokai Univ.)

16:10-16:30 WeB-4-3
Measurement of pressure distribution of wing surface like dragonfly's wing shape
Mitsuki Mitobe, Hisayoshi Naka, and Hiromu Hashimoto (Tokai Univ.)

16:30-16:50 WeB-4-4
Aerodynamic characteristics of flexible wing for micro air vehicle in gliding and flapping flight
Hisayoshi Naka, and Hiromu Hashimoto (Tokai Univ.)

16:50-17:10 WeB-4-5
Effect of vortex generated by flapping wings on aerodynamic forces with PIV measurement
Hisayoshi Naka, Mitsuki Mitobe, and Hiromu Hashimoto (Tokai Univ.)

Wednesday 17 June 15:30-17:10
WeC-4
Sensor Networks and Wearable Information Devices 2

Session Chair: Beomjoon Kim (The Univ. of Tokyo)
Guillaume Lopez (Aoyama Gakuin Univ.)

15:30-15:50 WeC-4-1
Influence of contact force and scanning velocity on finger-mounted tactile sensor using microphones
Yoshihiro Tanaka (Nagoya Institute of Technology / JST, PRESTO), Yuichiro Ueda, and Akihito Sano (Nagoya Institute of Technology)

15:50-16:10 WeC-4-2
Human behaviour recognition under ambulatory environment for a continuous blood pressure monitoring
Haruyuki Sanuki, Shin'ichi Warisawa, and Ichiro Yamada (The Univ. of Tokyo)

16:10-16:30 WeC-4-3
A cumulative error compensation model of dead reckoning toward a high accuracy indoor positioning system
Ryo Kanaoka (Aoyama Gakuin Univ.), Yukitoshi Kashimoto, Yutaka Arakawa (Nara Institute of Science and Technology), Yoshito Tobe (Aoyama Gakuin Univ.), and Keiichi Yasumoto (Nara Institute of Science and Technology)

16:30-16:50 WeC-4-4
Digital operation through pen based interface system
Junji Takahashi, Naoya Toyozumi (Aoyama Gakuin Univ.), Kai Nakazato (Communication Enterprise), and Guillaume Lopez (Aoyama Gakuin Univ.)

Wednesday 17 June 15:30-17:10
WeD-4
Intelligent Machines and Brain Science Applications 3

Session Chair: Masahiro Ohka (Nagoya Univ.)
Naoaki Tsuda (National Institute of Technology, Wakayama College)

15:30-15:50 WeD-4-1
Operation support of a car by use of acoustic information -Influence of concurrent change of pan and sound pressure-
Shunsuke Uchino, Taichi Sato, Hiroyuki Nakamura, and Hiroshi Igarashi (Tokyo Denki Univ.)

15:50-16:10 WeD-4-2
A study on attention control of ambient visual mark for driver assistant systems
Hiroshi Takahashi, and Hirohiko Honda (Shonan Institute of Technology)

16:10-16:30 WeD-4-3
Estimation of visual attention for multiple persons
Yoshihiro Ishihara, and Hiroshi Igarashi (Tokyo Denki Univ.)

16:30-16:50 WeD-4-4
Effects of multimodal information with delay
Kazuki Yokouchi, Hidehiro Tsuchiya, Taichi Sato, and Hiroshi Igarashi (Tokyo Denki Univ.)

16:50-17:10 WeD-4-5
Evaluation of human characteristic by visual information
Shintaro Ohtaki, and Hiroshi Igarashi (Tokyo Denki Univ.)

Session Chair: Kazuo Kiguchi (Kyushu Univ.)
Yoshiaki Hayashi (Saga Univ.)

MoP-01
Analysis of accumulated lubricant for air-helium gas mixture in HDD
Kyoung-Su Park (Gachon Univ.)

MoP-02
Change of flow characteristics of liquid nano-step due to heating
Shohei Fujikawa, Hiroshige Matsuoka, and Shigehisa Fukui (Tottori Univ.)

MoP-03
Effects of surface roughness on characteristics of liquid transfer due to breakage of liquid meniscus bridge
Ryo Shinohara, Mayu Miyamoto, Daichi Kondo, Hiroshige Matsuoka, and Shigehisa Fukui (Tottori Univ.)

MoP-04
Effects of solid surface roughness on vibration transfer characteristics of liquid meniscus bridge
Daichi Kondo, Mayu Miyamoto, Ryo Shinohara, Hiroshige Matsuoka, and Shigehisa Fukui (Tottori Univ.)

MoP-05
Simulation of the interaction between particle and slider surface
Sen Liu, Shengnan Shen, Hui Li, and Shijing Wu (Wuhan Univ.)

MoP-06
Theoretical analyses of interaction stresses acting between solid surfaces with one-dimensional material distribution based on Lennard-Jones potential
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