November 20 (Mon.)

Opening Remarks   *Room 1*

Chairperson: *Fumihito Arai, The University of Tokyo*

9:00-9:20   *Prof. Toshio Fukuda, Nagoya University (Honorary Chair)*
                   Prof. Fumihito Arai, The University of Tokyo (General Co-Chair)
                   Prof. Jun Ota, The University of Tokyo (General Co-Chair)

Plenary Talks   *Room 1*

Chairperson: *Shintaro Ito, Nagoya University*

9:20-10:05   Plenary Talk 1
                   Microfluidics and Lab-on-a-Chip Innovations: Pioneering Biophysics and
                   Biotechnology Research
                   Amy Q. Shen
                   Micro/Bio/Nanofluidics Unit
                   Okinawa Institute of Science and Technology Graduate University, Japan

10:05-10:20   ***Break***

Session MA1-1: (Organized Session 6):
Hyper-Adaptability   *Room 1*

Chairperson: *Toshiyuki Kondo, Tokyo University of Agriculture and Technology*

10:20-10:50   Keynote Talk 1
                   Classification of finger typing movements from muscle activity
                   Isao Nambu, Tatsuya Hoshino, Yoshiko Maruyama, and Yasuhiro Wada
                   Graduate School of Engineering, Nagaoka University of Technology

10:50-11:05   Evaluation of the Giving-Way-Prevention Function of a Soft Exosuit
                   Incorporating the Multi-articular Muscle Mechanism
                   Tomu Makino[1], Tetsuya Hasegawa[1], Shouhei Shirafuji[2], Jun Ota[3],
                   Arito Yozu[1]
                   [1]Department of Precision Engineering, School of Engineering,
                   The University of Tokyo, Tokyo
                   [2]Department of Mechanical Engineering, Faculty of Engineering Science,
                   Kansai University, Osaka
                   [3]Research into Artifacts, Center for Engineering (RACE), School of
                   Engineering, The University of Tokyo, Tokyo

11:05-11:20   CNN-based analysis of the relationship between DAT SPECT and motor function in patients with Parkinson's disease
Kohei Kaminishi[1], Moichi Ishikawa[2], Tetsuya Hasegawa[2], Ryosuke Chiba[3], Arito Yozu[2], Kaoru Takakusaki[3] and Jun Ota[1]
[1]Research into Artifacts, Center for Engineering (RACE), School of Engineering, the University of Tokyo
[2]Department of Precision Engineering, School of Engineering, The University of Tokyo,
[3]Division of Neuroscience, Department of Physiology, Asahikawa Medical University,

11:20-11:35   Modulated Brain Networks via Motor Learning
Saki Niiyama, Rie Yoshida Tamami Sudo, Megumi Miyashita and Toshiyuki Kondo
Department of Computer and Information Sciences, Graduate School of Engineering, Tokyo University of Agriculture and Technology,

11:35-11:50   Effect of Pharmacological Inactivation of the Cerebellum on Learning Function for Predictive Postural Control in Rat
Kaito Fukuhara[1], Akira Konosu[2], Tetsuro Funato[1], Dai Yanagihara[2]
[1]Department of Mechanical and Intelligent Systems Engineering, The University of Electro-Communications,
[2]Department of Life Sciences, The University of Tokyo,

11:50-12:05   Study on High-Level Structure of cognition control construction in Exploration and Exploitation within Multi-Armed Bandit Model of Reinforcement Learning
Jiaxing Tian[1] and Izawa Jun[2]
[1]Empowerment Informatics, Graduate School of Science and Technology, University of Tsukuba
[2]Institute of Systems and Information Engineering, University of Tsukuba

Session MA2-1: (Organized Session 3)
Cutting-edge Technologies for Sustaining Health and Wellness in the Elderly   Room 2

Chairperson: *Hisataka Maruyama, Nagoya University*
                    Eiko Takano, National Center for Geriatrics and Gerontology

10:20-10:35   1st Trial of Hyper Redundant Exoskeletal Manipulator with High Expandability
Yuki Wakayama, Jayant Unde and Yasuhisa Hasegawa
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University,

10:35-10:50   Development of integrated training system of fingers and upper limb for elderly
Mikiya Kubota[1], Hiromi Shimizu[1], Tomotaka Ito[1] and Mizue Suzuki[2]
[1]Graduate School of Integrated Science and Technology, Shizuoka University
[2]Hamamatsu University School of Medicine

10:50-11:05   Remote Haptic Calligraphy Measuring Deviation from Mode
Shota Ohtani[1], Yutaka Ishibashi[1], and Pingguo Huang[2]
[1]Graduate School of Engineering, Nagoya Institute of Technology
[2]Faculty of Economics and Information, Gifu Shotoku Gakuen University

11:05-11:20   Quantification of Motor Learning of Finger Dexterity by a Discriminant Model of Mild Cognitive Impairment
Kazuya Toshima[1,2], Yu Chokki[2], Toshiaki Wasaka[2], Tsukasa Tamaru[1], Yoshifumi Morita[2]
[1]Kaikoukai Rehabilitation Hospital
[2]Nagoya Institute of Technology

11:20-11:35   Walk-training Device Integrating Photoplethysmography Pulse Sensor in the Handle
Kouki Mori, Hisataka Maruyama
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University

11:35-11:50   Metaverse with Olfactory Sense for Walking Support
Kota Nishiyori[1], Yutaka Ishibashi[1], and Pingguo Huang[2]
[1]Graduate School of Engineering, Nagoya Institute of Technology
[2]Faculty of Economics and Information, Gifu Shotoku Gakuen University

11:50-12:20   Keynote Talk 2
Efficient Support of Early Detection, Prevention, and Recovery of/from Frailty Using Multisensory ICT
Yutaka Ishibashi
Graduate School of Engineering, Nagoya Institute of Technology

12:20-13:20   ***Lunch***

Plenary Talks   ***Room 1***

Chairperson: *Tetsuro Funato, The University of Electro-Communications*
13:20-14:05   Plenary Talk 2
Proposal of Motor Learning Model toward Explainability of Adaptability in Multiple Levels
Yuichi Kobayashi
Department of Mechanical Engineering, Shizuoka University

14:05-14:20   ***Break***

Session MP1-1: (Organized Session 8-1)
Intelligent Robot Systems   ***Room 1***

Chairperson: *Takahiro Ikeda, Gifu University*
                    Kenichi Ohara, Meijo University

14:20-14:35   Comparison of User Interfaces for Semi-Automatic Visual Support System
                   Using Drone for Teleoperated Construction Robot
                   Takahiro Ikeda, Satoshi Ueki and Hironao Yamada
                   Department of Mechanical Engineering, Gifu University

14:35-14:50   Validation of the effectiveness of robot advance notice for movement in
                   avoiding people considering psychological evaluation
                   Hisanori Suito[1], Kenichi Ohara[2]
                   *[1]Department of Mechatronics Engineering, Guraduate of Science and
                   Technology,*
                   *[2]Department of Mechatronics Engineering, Fuculty of Science and
                   Technology,*

14:50-15:05   Gradient-Based Fine-Tuning Strategy for Improved Transfer Learning on
                   Surgical Images
                   Ana Davila[1], Jacinto Colan[2] and Yasuhisa Hasegawa[2]
                   [1]Institutes of Innovation for Future Society, Nagoya University
                   *[2]Dept. of Micro-Nano Mechanical Science and Engineering, Nagoya
                   University, Aichi*

15:05-15:20   Removing dynamic objects from 3D map by state grid map
                   Kosuke Tokuda, Keisuke Urasaki, Yuki Kitsukawa and Tsuyoshi Tasaki
                   Graduate School of Science and Technology, Meijo University

15:20-15:35   Enhancing Gradient-Based Inverse Kinematics with Dynamic Step Sizes
                   Jacinto Colan[1], Ana Davila[2] and Yasuhisa Hasegawa[1]
                   *[1]Dept. of Micro-Nano Mechanical Science and Engineering, Nagoya
                   University*
                   [2]Institutes of Innovation for Future Society, Nagoya University

15:35-15:50   Sensor Integration with Dynamic Confidence Estimation Using
                   Self-Localization Neural Networks
                   Satoshi Kikuchi, Tsuyoshi Tasaki
                   Graduate School of Science and Technology, Meijo University

Session MP2-1: (Organized Session 11)
New materials and processing for micro/nano devices   Room 2

Chairperson: *Junpei Sakurai, Nagoya University*
                      Mizue Mizoshiri, Nagaoka University of Technology
                      Yuki Toku, Nagoya University

14:20-14:50   Keynote Talk 3
                     Electromigration-driven micro/nanowire growth design
                     Yasuhiro Kimura
                     Department of Micro-Nano Mechanical Science and Engineering,
                     Nagoya University

14:50-15:05   Influence of additive silver nanoparticles on femtosecond laser
                     pulse-induced copper precipitation from glyoxylic acid copper complex
                     ink
                     Huy Tran Quang[1], Tomoji Ohishi[2], Mizue Mizoshiri[1]
                     [1]Department of Mechanical Engineering, Nagaoka University of
                     Technology
                     [2]Department of Applied Chemistry, Shibaura Institute of Technology

15:05-15:20   The characteristics evaluation of Ni-Nb-Zr thin film amorphous alloys for
                     ultrasonic sensors
                     Jinglan Xie, Fuyuki, Haga, Chiemi Oka, Seiichi Haya, Junpei Sakurai
                     Department of Micro-Nano Systems Engineering, Graduate School of
                     Engineering, Nagoya University

15:20-15:35   Efficient and Accurate Design of Infrared and Laser-Compatible Stealth
                     Metasurface Using Bidirectional Artificial Neural Network
                     Pengfei Zhang[1], Xiong Cheng[2], Yao Ma[3], Jun Liu[3], Liyan Zhu[3], Daying
                     Sun[2], Xiaodong Huang[1]*
                     [1]Key Laboratory of MEMS of the Ministry of Education, School of
                     Integrated Circuits
                     [2]School of Integrated Circuits, Nanjing University of Science and
                     Technology
                     [3]National Key Laboratory of Electromagnetic Environmental Effects and
                     Electro-optical Engineering, Army Engineering
                     University

15:50-16:05   ***Break***

Session MP1-2: (Organized Session 8-2)
Intelligent Robot Systems   Room 1

Chairperson: *Takahiro Ikeda, Gifu University*
                      Kenichi Ohara, Meijo University

16:05-16:20   Obstacle detection based on self-position correction using estimated
                 distance information and 3D-Map
                 Daijiro Higashi, Tsuyoshi Tasaki
                 Graduate School of Science and Technology, Meijo University

16:20-16:35   LLM-Based Human-Robot Collaboration Framework for Manipulation
                 Tasks
                 Haokun Liu[1], Yaonan Zhu[1], Kenji Kato[2], Izumi Kondo[2], Tadayoshi
                 Aoyama[1], and Yasuhisa Hasegawa[1]*
                 *[1]Department of Micro-Nano Mechanical Science and Engineering,
                 Nagoya University*
                 [2]National Center for Geriatrics and Gerontology,

16:35-16:50   Pose Estimation in Simple Shape Objects Using Two Viewpoints
                 Kazuya Yabashi, Tsuyoshi Tasaki
                 Graduate School of Science and Technology, Meijo University

16:50-17:05   Grasp pose estimation for product arrangement using coarse posture
                 estimation
                 Takumi Okamoto, Tsuyoshi Tasaki
                 Graduate School of Science and Technology, Meijo University

17:05-17:20   Improving grasp ability by reducing grasping point estimation errors of
                 suction pad unit
                 Ryuichi Miura, Tsuyoshi Tasaki
                 Graduate School of Science and Technology, Meijo University

17:20-17:35   Human Preferences and Robot Constraints Aware Shared Control for
                 Smooth Follower Motion Execution
                 *Qibin Chen[1], Yaonan Zhu[1], Kay Hansel[2], Tadayoshi Aoyama[1], and
                 Yasuhisa Hasegawa[1]*
                 *[1]Department of Micro-Nano Mechanical Science and Engineering,
                 Nagoya University*
                 [2]Department of Computer Science, Technical University of Darmstadt

Session MP2-2: (Organized Session 7)
In-body Cybernetic Avatars   ***Room 2***

Chairperson: *Fumihito Arai, The University of Tokyo*

16:05-16:35   Keynote Talk 4
                     The Future Utilization of In-Body Cybenetic Avatars as Guardians of
                     Health and Treatment Assistants
                     Hiroki Kawashima
                     Department of Gastroenterology and Hepatology, Nagoya University
                     Graduate School of Medicine

16:35-16:50   Deployment and Fixation Mechanism of Intestinal Monitoring Device
                     Toshiro Yamanaka and Fumihito Arai
                     Department of Mechanical Engineering, the University of Tokyo

16:50-17:05   Performance Evaluation on Three-Dimensional Magnetic Field
                     Gradient-Based In-body CA Localization
                     Takumi Kobayashi, Junpei Tsuchida and Daisuke Anzai
                     Graduate School of Engineering, Nagoya Institute of Technology

17:05-17:20   Fabrication of Hydrogel Organ Model Mimicking Electrical Impedance
                     for Evaluation of Communication between In-body and Out-of-body of
                     In-body Cybernetic Avatar
                     Hisataka Maruyama, Du Jinhao, Daiki Ueda, Kento Kawahuku
                     Department of Micro-Nano Mechanical Science and Engineering, Nagoya
                     University

17:20-17:35   Shoulder-Wearable Fabric Actuator for Directional Sensations
                     Kenta Yokoe[1], Tadayoshi Aoyama[1], Yuki Funabora[2], Masaru Takeuchi[1]
                     and Yasuhisa Hasegawa[1]
                     [1]Department of Micro-Nano Mechanical Science and Engineering,
                     Nagoya University,
                     [2]Department of Information and Communication Engineering, Nagoya
                     University,

17:35-17:50   Immersive micromanipulation interface for suction/discharge sensation to
                     facilitate cell movement and grasping
                     Sumiwa Saito[1], Tadayoshi Aoyama[1], Yuki Funabora[2], Masaru Takeuchi[1]
                     and Yasuhisa Hasegawa[1]
                     [1]Department of Micro-Nano Mechanical Science and Engineering,
                     Nagoya University,
                     [2]Department of Information and Communication Engineering, Nagoya
                     University,

18:00-   ***Beer Party***

November 21 (Tue.)

Plenary Talks   ***Room 1***

Chairperson: *Fumihito Arai, The University of Tokyo*

9:00-9:45   Plenary Talk 3
                   Stretchable and biodegradable electronics based on liquid metal
                   encapsulated in microfluidics
                   Xingyu Jiang
                   *Department of Biomedical Engineering, Southern University of Science
                   and Technology*

9:45-10:00   ***Break***

Session TA1-1: (Organized Session 4)
Emerging technologies for spatiotemporal analysis of cells   ***Room 1***

Chairperson: *Shinya Sakuma, Kyusyu University*
                    Yoshitaka Shirasaki, The University of Tokyo
                    Niko Kimura, Tokyo University of Agriculture and Technology

10:00-10:30   Keynote Talk 5
                   Spatiotemporal analysis of cellular nanostructure based on scanning ion
                   conductance microscopy
                   Hiroki Ida
                   Nagoya University

10:30-10:45   Live Cell Imaging of Humoral Factor Secretion as an Indicator of
                   Cytotoxicity in Cancer Immunity
                   *Yuto Kurisu[1], Zhuohao Yang[1,2], Koji Nagaoka[3], Kazuhiro Kakimi[3,4],
                   Takashi Funatsu[1] and Yoshitaka Shirasaki[1,2]*
                   [1]Graduate School of Pharmaceutical Sciences, The University of Tokyo
                   *[2]Research Center for Advanced Science and Technology, The University
                   of Tokyo*
                   [3]Department of Immunotherapeutics, The University of Tokyo Hospital
                   [4]Department of Immunology, Kindai University Faculty of Medicine

10:45-11:00   Microfluidic chip integrated single-cell pipette for tunable resolution of
                   flow control
                   *Nariaki Kiyama[1], Makoto Saito[1], Yoshitaka Shirasaki[2], Yoko Yamanishi[1],
                   Shinya Sakuma[1]*
                   [1]Department of Mechanical Engineering, Kyushu University
                   [2]Department of Biological Sciences, The University of Tokyo

11:00-11:15   Visualization of Secretion Dynamics by Time Differentiation of Secretion Signals
Zhuohao Yang[1], Mai Yamagishi[2], Nubutake Suzuki[2], Kazuyo Moro[3], Etsushi Kuroda[4], Shinya Sakuma[5], Takashi Funatsu[6] and Yoshitaka Shirasaki[1]
[1]Research Center for Advanced Science and Technology, The University of Tokyo
[2]Live Cell Diagnosis, Ltd.
[3]RIKEN Center for Integrative Medic al Sciences
[4]Department of Immunology, Hyogo College of Medicine
[5]Department of Mechanical Engineering, Kyushu University
[6]Graduate School of Pharmaceutical Sciences, The University of Tokyo

11:15-11:30   On-chip production of lipid-based nanoparticles utilizing spatiotemporally controlled microvortexes
Makoto Saito[1], Niko Kimura[2], Yoko Yamanishi[1] and Shinya Sakuma[1]
[1]Department of Mechanical Engineering, Faculty of Engineering, Kyushu University, JAPAN
[2]Department of Applied Chemistry, Faculty of Engineering, Kyushu University, JAPAN

11:30-11:45   Enhancement of expansion rates of temperature responsive hydrogels toward highly efficient on-chip gel valve
Kyoka Nakano[1], Yoshiyuki Yokoyama[2], and Takeshi Hayakawa[1]
[1]Department of Precision Engineering, Chuo University
[2]Toyama Industrial Technology Research and Development Center

Session TA2-1: (Organized Session 10)
Micro/Nano Functional Devices for in vivo/vitro applications   *Room 2*

Chairpersons: *Masaru Takeuchi, Nagoya University*
Tadayoshi Aoyama, Nagoya University

10:00-10:15   Design and Fabrication of a Remote-Center-of-Motion Modular-Robotic-Extender with Composite-Compliant Joints
Haoran Yao, Hao Mo, Hirotaka Sugiura, Fumihito Arai
Department of Mechanical Engineering, The University of Tokyo

10:15-10:30   Oocyte Rotation Assistance System Using AI Trained on the Micromanipulations of a Skilled Operator
Ryoya Mori[1], Tadayoshi Aoyama[1], Taisuke Kobayashi[2,3], Kazuya Sakamoto[1], Masaru Takeuchi[1], and Yasuhisa Hasegawa[1]
[1]Department of Micro-Nano Mechanical Science and Engineering, Nagoya University

[2]*Principles of Informatics Research Division, National Institute of Informatics*
[3]*Department of Informatics, The Graduate University for Advanced Studies (SOKENDAI)*

10:30-10:45   High-performance All-solid-state Micro-supercapacitor by Using Oxygen Plasma Treatement on LiPON Electrolyte
Jian Wang[1], Yao Ma[2], Liyan Zhu[2], Xiaodong Huang[1]*
[1]*Key Laboratory of MEMS of the Ministry of Education, School of Integrated Circuits, Southeast University*
[2]*National Key Laboratory of Electromagnetic Environmental Effects and Electro-optical Engineering, Army Engineering University*

10:45-11:00   Cell Culture Environment Sustaining microphysiological system (CCES-MPS) for Pharmacokinetic Evaluation
Hajime Miyashita[1],Kenta Shinha[2] and Hiroshi Kimura[1,2]
[1]*School of Science and Technology, Tokai University*
[2]*Micro/Nano Technology Center, Tokai University*

11:00-11:15   Development of an Imaging-based Method for Evaluating Local Epithelial Paracellular Barrier Function
Ryuya Kida, Mamiko Tsugane, and Hiroaki Suzuki
Graduate school of Science and Engineering, Chuo University

11:15-11:30   A Neurostimulator for Controlling Muscle Contraction Force through Wireless Bidirectional Communication
Masaru Takeuchi[1], Takashi Niimi[1], Katsuhiro Tokutake[2], Tadayoshi Aoyama[1], Shigeru Kurimoto[2], Hitoshi Hirata[2] and Yasuhisa Hasegawa[1]
[1]*Department of Micro-Nano Mechanical Science and Engineering, Nagoya University*
[2]*Department of Human Enhancement and Hand Surgery, Nagoya University*

11:30-12:00   Keynote Talk 6
Model-based design and control of skeletal muscle and its medical application
Wataru HIJIKATA
Tokyo Institute of Technology

12:00-13:00   ***Lunch***

Session TP: Poster Session
13:00-14:00

TP-01   Tactile Sensor Combining MEMS Cantilevers and Pressure-Sensitive Conductive Elastomer
Ryusuke Mitobe, Yingquan Zheng, Takashi Abe, Masayuki Sohgawa
Graduate School of Science and Technology, Niigata University

TP-02   Deformable Object Manipulation Using Human Demonstration Enhanced Deep Deterministic Policy Gradient
Zihao Dong[1], Jian Huang[1], Haoyuan Wang[1], Bo Yang[1], Dongrui Wu[1], Yaonan Zhu[2] and Yasuhisa Hasegawa[2]
[1]School of Artificial Intelligence and Automation, Huazhong University of Science and Technology
[2]Micro-nano Mechanical Science and Engineering, Nagoya University,

TP-03   Development of a Liquid-metal-enhanced Continuum Joint with Variable Stiffness Capability for Flexible Endoscopy
*Dezhi Song[1], Yongxiang Song[2], Di Wu[1], Xiangyu Luo[1], Chaoyang Shi[*1]*
[1]School of Mechanical Engineering, Tianjin University
[2]Honor Device Co., Ltd.

TP-04   Development of robotic hand using dual-directional bending soft fingers and bellows suction mechanism
Haruki Nakano, Yuiki Yamasaki, Shuichi Wakimoto, Takefumi Kanda, Daisuke Yamaguchi
Graduate School of Natural Science and Technology, Okayama University

TP-05   Development of a polymer-based light driven actuator
Seiji Omata[1], Kodai Kanemaru[2], Ryuhei Fukada[2], Akira Kawabata[2], Yasuyuki Morita[1]
[1]Faculty of Advanced Science and Technology, Kumamoto University,
[2]Graduate Shool of Science and Technology, Kumamoto University

TP-06   Automated Lipid Bilayer Formation by Capacitance Feedback Control
Hiroto Ishizuka and Kan Shoji
Department of Mechanical Engineering, Nagaoka University of Technology

TP-07   Dual Hand Cooperation System of 5-DoF micromanipulators with Remote Control Center
Hao Mo, Haoran Yao, Hirotaka Sugiura, Fumihito Arai
Department of Mechanical Engineering, The University of Tokyo

TP-08   Magnetically Controlled Biopsy Robot with Multiple Motions
                    Yuguo Dai, Toshiro Yamanaka, Kanako Harada, Fumihito Arai
                    Department of Mechanical Engineering, the University of Tokyo

TP-09   Shape Measurement of Pneumatically Inflated Balloon Using
                    Conductive Rubber
                    Kenji Takeda, Toshiro Yamanaka, Yuki Kotani, Hirotaka Sugiura,
                    Fumihito Arai
                    Graduate School of Engineering, The University of Tokyo

TP-10   Durable superhydrophobic surfaces of polydimethylsiloxane for
                    preventing yeast adsorption treated by irradiating green femtosecond
                    laser pulses
                    Ryusuke Mitobe, Yingquan Zheng, Takashi Abe, Masayuki Sohgawa
                    Mizue Mizoshiri[1], Yosuke Oda[1], Raihi Shinzawa[1], Akihiro Nakamura[2],
                    Yoshiyuki Suzuki[2], Yukina Kitahara2, Yuka Takahashi[2], Wataru
                    Ogasawara[2]
                    [1]Department of Mechanical Engineering, Nagaoka University of
                    Technology
                    [2]Department of Bioengineering, Nagaoka University of Technology

TP-11   Rapid Microstructure Modification of Additively Manufactured
                    Ni-Based Superalloy using High-Density Pulsed Electric Current
                    Chang Liu[1], Shaojie Gu[1], Xinming Yan[1], Sungmin Yoon[1], Yasuhiro
                    Kimura[1], Yuhki Toku[1], Yang Ju[2]*
                    [1]Department of Micro-Nano Mechanical Science and Engineering,
                    Nagoya University
                    [2]School of Mechanical Engineering, Zhejiang University

Plenary Talks   ***Room 1***
Chairperson: *Hisataka Maruyama Nagoya University*

14:00-14:45   Plenary Talk 4
                    Improving dexterity in robotic contact and non-contact manipulation.
                    Towards high-speed manufacturing and cell sorting
                    Michaël GAUTHIER
                    Université de Franche-comté, institut FEMTO-ST, CNRS, Sup-Microtech,
                    UTBM, Besançon, France

14:45-15:00   ***Break***

Session TP1-1: (Organized Session 2-1)
Cutting-edge sensors and actuators utilizing micro-nano science   **Room 1**

Chairperson: *Hirotaka Sugiura, The University of Tokyo*
                      Kazuyoshi Tsuchiya, Tokai University
                      Taisuke Masuda, The University of Tokyo

15:00-15:15   Development of Miniaturized Microneedle pH Sensors Based on Zinc
                     Oxide for Real-Time pH Sensing of Various Micro-Sized Biological Cells
                     *Jyoti Jaiswal[*1,2], Kazuyoshi Tsuchiya[*1,3]*
                     [1]Micro/Nano Technology Center, Tokai University
                     *[2]Centre for Advanced Research, Department of Physics, Rajiv Gandhi
                     University*
                     [3]Department of Mechanical Engineering, Tokai University

15:15-15:30   Fabrication of Probe Type Oxygen Microsensor Using Hybrid Process of
                     Photolithography and 3D Printing
                     *Juntaro Nomaru, Taisuke Masuda, Satoshi Amaya, Shiro Watanabe, and
                     Fumihito Arai*
                     The University of Tokyo

15:30-15:45   Aptamer-Modified DNA Nanopore Sensor for Biomolecular
                     Measurements
                     Hiromu Akai, and Kan Shoji
                     *Department of Mechanical Engineering, Nagaoka University of
                     Technology*

15:45-16:15   Keynote Talk 7
                     Frequency Modulated and Rate Integrating Gyroscope Using
                     Independently Controlled Two Resonances on Single Resonator

                     Takashiro Tsukamoto
                     Tohoku University

Session TP2-1: (Organized Session 1)
Advanced Micro-Nano Systems for Biomedical Applications   **Room 2**

Chairperson: *Hisataka Maruyama, Nagoya University*

15:00-15:15   High-speed Single Protoplast Pickup System Based on the Map of
                     Protoplasts at Plant Root Tip
                     Daito Ando[1], Bilal Turan[1], Yuko Ukai[2], Yoshikatsu Sato[2], Fumihito Arai[1]
                     [1]Department of Mechanical Engineering, The University of Tokyo
                     [2]Institute of Transformative Bio-Molecules, Nagoya University

15:15-15:30   Contact Detection of Forceps for a Vitreoretinal Surgical Simulator Using Infrared Reflection Images of Forceps
Kenta Noda, Hisataka Maruyama
Department of Micro Nano Mechanical Science and Engineering ,
Nagoya University

15:30-15:45   Micromanipulation of oocyte by a robot system using image and QCR force sensor
Kazusa Otani, Hirotaka Sugiura, Shiro Watanabe, Turan Bilal, Satoshi Amaya, Fumihito Arai
Department of Mechanical Engineering, The University of Tokyo

15:45-16:00   Fabrication of Dielectric Elastomer Actuator Made of an Organogel with Internal Structures
Masato Higuchi, Takeshi Hayakawa
Department of Precision engineering, Chuo University

16:00-16:15   Manipulation of Single Oocyte Using Microfluidic Chip on Robotic Manipulator
Shuzhang Liang, Satoshi Amaya, Hirotaka Sugiura, Hao Mo, Yuguo Dai, Fumihito Arai
Department of Mechanical Engineering, Graduate School of Engineering, The University of Tokyo

16:15-16:30   Optically-controlled Variable-stiffness Microgripper for Micromanipulation
Hisataka Maruyama, Yoshikatsu Yammaguchi
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University

16:15-16:30   ***Break***

Session TP1-2: (Organized Session 2-2)
Cutting-edge sensors and actuators utilizing micro-nano science   Room 1

Chairperson: Hirotaka Sugiura, The University of Tokyo
Kazuyoshi Tsuchiya, Tokai University
Taisuke Masuda, The University of Tokyo

16:30-16:45   Development of wearable solid state K^+ ion sensors based on sputtered BiSbO4 thin films for health monitoring
Han Suwu[1], Jyoti Jaiswal[*2,3], Kazuyoshi Tsuchiya[*2,4]

[1]Department of Precision Engineering, Tokai University
[2]Micro/Nano Technology Center, Tokai University
[3]Centre for Advanced Research, Department of Physics, Rajiv Gandhi University
[4]Department of Mechanical Engineering, Tokai University

16:45-17:00   PLL-Integrated Quartz Crystal Resonator for the High Speed and Highly Sensitive Force Measurement
Shiro Watanabe[1], Hirotaka Sugiura[1] and Fumihito Arai[1]
[1]Department of Mechanical Engineering, Graduate School of Engineering, The University of Tokyo

17:00-17:15   A Light-Weight Convolutional Neural Network for Super-Resolving SEM Images to Enhance Real-Time Micro-Nano Manipulation
Guangyi Zhang[1], Sheng Zeng[2], Liang Fang[1] and Zhan Yang[1]
[1]School of Mechanical and Electric Engineering, Soochow University
[2]School of Mechanical Engineering, Tianjin University

17:15-17:30   QCR force sensor having ultra-low loading relaxation effect using direct bonding technique
Hirotaka Sugiura, Shiro Watanabe, Satoshi Amaya, Fumihito Arai
Department of mechanical engineering, Graduate school of engineering, The University of Tokyo

18:00-   **Reception**

November 22 (Wed)

Session WA1-1: (Organized Session 9)
Machine-fluid interactions in microscale   *Room 1*

Chairpersons: *Takeshi Hayakawa, Chuo University*

9:45-10:00   Analysis of on-chip cell rotation based on a vibration-induced flow
                   Masatomo Arai, Hiroyasu Kobayashi, and Takeshi Hayakawa
                   Department of Precision Engineering, Chuo University

10:00-10:15   Experimental and Numerical Investigation of Particle Capture for
                   Agglutination-Based NP detection Using the Vibration-Induced Flow
                   *Kanji Kaneko[1], Mamiko Tsugane[1], Yosuke Hasegawa[2], Takeshi
                   Hayakawa[1], and Hiroaki Suzuki[1]*
                   *[1]Department of Precision Mechanics, Graduate school of Science and
                   Engineering, Chuo University*
                   [2]Institute of Industrial Science, The University of Tokyo

10:15-10:30   Development of a novel fluid oscillation needle-free injection method
                   using electrically induced microbubbles
                   Yibo Ma, Ken-Ichi Wada, Naotomo Tottori, Yoko Yamanishi
                   *Dept. of Mechanical Engineering, Faculty of Engineering, Kyushu
                   University*

10:30-10:45   Evaluation of osmotic water permeability of cyanobacteria in single-cell
                   scale
                   Shingo Kaneko[1], Masaru Tsujii[2], Nobuyuki Uozumi[2] and Fumihito Arai[1]
                   [1]Department of Mechanical Engineering, The University of Tokyo
                   [2]Department of Biomolecular Engineering, Tohoku University

10:45-11:00   Size Separation of Microparticles by Using Acoustofluidic System with an
                   Open Microfluidic Chip
                   Natusmi HIRATA, and Takeshi HAYAKAWA
                   Department of Precision Engineering, Chuo University

11:00-11:15   On-demand Local Liquid Replacement by Utilizing Microvortex
                   Makoto Saito, Yoko Yamanishi, Shinya Sakuma
                   Department of Mechanical Engineering, Kyushu University.

Session WA2-1: (Organized Session 5)
Functional Interfaces and Hydro-Electrochemical Mechatronics   **Room 2**

Chairperson: *Yoko Yamanishi, Kyusyu University*
                       Shingo Maeda, Shibaura Institute of Technology

9:45-10:00   Temperature-Dependent Diffusion of DNA-functionalized Nanoparticles on Supported Lipid Bilayers
Miho Tagawa[1,2], Chandan Kumar[1], Sakiko Nakada[2], Ryugo Tero[3], Shunta Harada[1,2], Toru Ujihara[1,2]
[1]Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University
[2]Department of Materials Science and Engineering, Nagoya University
[3]Department of Applied Chemistry and Life Science, Toyohashi University of Technology

10:00-10:15   On-Chip High-Speed and Continuous Electro Cell Fusion Utilizing Droplets Microfluidics
Hiroki Fukunaga[1], Naotomo Tottori[1], Shinya Sakuma[1], Tomomi Tsubouchi[2] and Yoko Yamanishi[1]
[1]Department of Mechanical Engineering, Faculty of Engineering, Kyushu University
[2]National Institute for Basic Biology

10:15-10:30   Gas-jet induced dewetting
Nobuyuki Tanaka[1] and Yoshihide Haruzono[2]
[1]RIKEN Center for Biosystems Dynamics Research
[2]Kitagawa Corporation

10:30-10:45   Electrohydrodynamic Fluid-driven Pump
Zebing mao[1], Yuhei Yamada[2], Naoki Hosoya[3], Shingo Maeda[1,2]*
[1]Department of Mechanical engineering, Tokyo institute of technology, Tokyo
[2]Living Systems Materialogy (LiSM) Research Group, International Research Frontiers Initiative (IRFI), Tokyo Institute of Technology, Tokyo
[3]Department of Engineering Science and Mechanics, Shibaura Institute of Technology

10:45-11:00   Electrowetting-based double-side printing for paper mechatronics
Atsushi Matsushita, Hiroki Shigemune
Electrical Engineering and Computer Science, Shibaura Institute of Technology

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11:00-11:15　　　Evaluation of Performance of Dielectric Elastomer Actuator Made of an Organogel
　　　　　　　　　Yuta Tezuka, Takeshi Hayakawa
　　　　　　　　　Department of Precision Engineering, Chuo University

11:15-10:30　　　***Break***

Plenary Talks　　　　　　　　　　　　　　　　　　　　　***Room 1***

Chairperson:　　　*Seiichi Hata, Nagoya University*

11:30-12:00　　　Plenary Talk 5
　　　　　　　　　Carbon nanotube-based flexible electronics: From transistors and integrated circuits to machine learning
　　　　　　　　　Yutaka Ohno
　　　　　　　　　Institute of Materials and Systems for Sustainability, Nagoya University, Aichi, Japan

12:00-　　　　　　***Award Ceremony and Closing***