

MHS2017

*2017 International Symposium on Micro-NanoMechatronics and Human Science
(From Micro & Nano Scale Systems to Robotics & Mechatronics Systems)
Symposium on “Understanding brain plasticity on body representations to promote their adaptive
functions” Grant-in-Aid for Scientific Research on Innovative Areas, MEXT, Japan
Dec. 3 - 6, 2017, Nagoya, Japan*

December 4 (Mon)

Location: Noyori Conference Hall

Opening Remarks

Conference Room 1

Chairperson: *Fumihito Arai, Nagoya University*

09:00-9:20 *Prof. Toshio Fukuda, Meijo University, Japan (Honorary Chair)
Prof. Fumihito Arai, Nagoya University, Japan (General Co-Chair)
Prof. Jun Ota, The University of Tokyo, Japan (General Co-Chair)*

Session MA1-1: (Organized Session 3) :

Technologies for time-resolved characterization of single cell, cell community and tissues

Conference Room 1

Chairperson: *Shinya Sakuma, Nagoya University
Yoshitaka Shirasaki, The University of Tokyo*

09:20-9:50 *Model-based Feedback Control of Synthetic Biomolecular Circuits
Yutaka Hori, Keio University*

9:50-10:05 *Vortex Generation in Microchannel for On-demand Mixing
Yusuke Kasai, Shinya Sakuma and Fumihito Arai, Nagoya University*

10:05-10:20 *Stochastic Secretion Response to Transient Stimulus of Type-2 Innate
Lymphoid Cells (ILC2)
Kazuki Yoda, Kaede Miyata, Nobutake Suzuki, Sotaro Uemura, Kazuyo Moro
and Yoshitaka Shirasaki, The University of Tokyo*

10:20-10:35 Time Evolution of Microenvironment around Cells Regulated by the Secretion Activity and Culture Density of the Cells.
Mai Yamagishi, Yutaka Hori, Sotaro Uemura, Osamu Ohara and Yoshitaka Shirasaki, The University of Tokyo

10:35-10:50 Automated On-chip Sorting System for Separation of Spheroid Based on the Mechanical Characteristics
Kou Nakahara, Shinya Sakuma and Fumihito Arai, Nagoya University

***Session MA2-1: (Organized Session15)
Bioactuator, Biobot***

Conference Room 2

Chairperson:

09:20-9:50 Non Natural Tiny-wet Machine: Molecular Robot
Yusuke Sato, Yuichi Hiratsuka, Ibuki Kawamata, Satoshi Murata and Shin-ichiro M. Nomura, Tohoku University

9:50-10:05 Direct Measurement of Propelling Force of Water Strider
Kaoru Uesugi, Hiroyuki Mayama and Keisuke Morishima, Osaka University

10:05-10:20 Direct Observation and Behavior Analysis of *Enchytraeus japonensis* in Soft Material for Swarm Intelligent Micro Robots
Kazuma Toyoda, Kaoru Uesugi and Keisuke Morishima, Osaka University

10:20-10:35 Fabrication Consideration of Three-dimensional Skeletal Muscle Fiber using Biomaterial
Yuta Iwamoto, Kenichi Ohara, Masaru Takeuchi, Akihiko Ichikawa and Toshio Fukuda, Meijo University

10:35-10:50 In Vivo Test of Inductively Powered Neurostimulator
Takahiro Miyamoto, Masaru Takeuchi, Tomonori Nakano, Tadayoshi Aoyama, Shigeru Kurimoto, Hitoshi Hirata and Yasuhisa Hasegawa, Nagoya University

10:50-11:00 ***Coffee Break***

Session MA1-2: (Organized Session14)
Bionic Humanoid and Surgical Systems

Conference Room 1

- Chairperson: *Seiji Omata, Nagoya University*
Jun Nakanishi, Nagoya University
- 11:00-11:30 Multi Degree-of-freedom Surgical Manipulator using Largely Deformable Mechanical Components
Jumpei Arata, Kyusyu University
- 11:30-11:45 A Concept of a User Interface Capable of Intuitive Operation of 4-DoF Articulated Forceps
Keisuke Ohara, Jacinto Enrique Colan Zaita, Tadayoshi Aoyama, Jun Nakanishi and Yasuhisa Hasegawa, Nagoya University
- 11:45-12:00 Local Internal Pressure Measurement in Lesion Blood Vessel Model using Ultra-miniature Fiber-optic Pressure Sensor
Tadao Matsunaga, Soyoka Osaki, Yasutomo Shimizu, Masaaki Shojima, Hiroshi Yoshida, Noriko Tsuruoka, Simon Tupin, Makoto Ohta, Akira Ito and Yoichi Haga, Tohoku University
- 12:00-12:15 Development of a Blood Vessel Model Attached with Ultrasound Sensors to Quantify Intravascular Treatment Skills
Hiroshi Yoshida, Tadao Matsunaga, Yasutomo Shimizu, Masaaki Shojima, Kaihong Yu, Makoto Ohta, Noriko Tsuruoka and Yoichi Haga, Tohoku University
- 12:15-12:30 Mechanical Characterization of Ultra-thin Membrane using Force Sensing Chip
Noriaki Hasegawa, Shinya Sakuma, Yuichi Murozaki and Fumihito Arai, Nagoya University

***Session MA2-2: (Organized Session1)
Advanced Micro-Nano Systems for Biomedical Applications***

Conference Room 2

- Chairperson: *Hisataka Maruyama, Nagoya University*
- 11:00-11:30 Hydrogel Microfibers for Biochemical Applications
Hiroaki Onoe, Keio University
- 11:30-11:45 Fabrication of Three-dimensional Deformable Microfilter for Capturing Target Cells
Kenshiro Nakatake, Yuta Nakashima, Ryo Iwamoto, Ayase Tashima, Yusuke Kitamura, Keiichiro Yasuda, Masaaki Iwatsuki, Hideo Baba, Toshihiro Ihara and Yoshitaka Nakanishi, Kumamoto University
- 11:45-12:00 Microfluidic Liquid Cell in Scanning Electron Microscope for Visualization of In-liquid Living Cell
Tadashi Ishida, Tokyo Institute of Technology
- 12:00-12:15 Manipulation Technologies of Photocurable Micro-droplet for Three-dimensional Parallel Single Cell Assembly
Moeto Nagai, Shogo Sato, Yoshitaka Kitagawa, Sho Kawaharada, Shota Hiratsuka and Takayuki Shibata, Toyohashi University of Technology
- 12:15-12:30 Hydrogel Fluorescent Sensor for Long-term Environmental Measurement
Yusuke Akita, Hisataka Maruyama, Taisuke Masuda and Fumihito Arai, Nagoya University
- 12:30-13:30 ***Lunch***

Poster Session I

Poster Area (1st Floor)

Chairperson:

13:30-14:30

- MP-01 A Robot Controller for a Working Cell
Kazumasa Kito, Kyoichi Tatsuno, Shinobu Otao, Tatsuo Hosotani and Katsumi Yoshino, Meijo University
- MP-02 Autonomous Mowing Robot using a Tracking Laser Rangefinder
Kensuke Nomura, Taku Saito, Yuhei Yamazaki, Kyoichi Tatsuno, Kiyoshi Sota, Yushi Fuziwara, Eiji Inoue and Katsumi Yoshino, Meijo University
- MP-03 Remote Control Console of Mowing Robot with Image Monitor
Yuhei Yamazaki, Kensuke Nomura, Taku Saito, Kyoichi Tatsuno, Yushi Fujiwara, Kiyoshi Sota, Eiji Inoue and Katsumi Yoshino, Meijo University
- MP-04 Position Measurement for a Mobile Weed Mowing Robot by a Camera and a Laser Rangefinder
Taku Saito, Kensuke Nomura, Yuhei Yamazaki, Kyoichi Tatsuno, Kiyoshi Sota, Yushi Huziwara, Eiji Inoue and Katsumi Yoshino, Meijo University
- MP-05 A Novel Microneedle Device Having Flexible Substrate and Strong Needles using PVA and Gelatin
Ryota Nishikata, Hirofumi Miki and Shigeki Tsuchitani, Wakayama University
- MP-06 Development of a New Type Fabrication Process in Microneedles
Yugo Oku and Hirofumi Miki, Wakayama University
- MP-07 Fabrication of the Brain Model with Soft Material for Surgical Simulator
Naoki Kotani, Akihiko Ichikawa, Akiyuki Hasegawa, Masaru Takeuchi and Toshio Fukuda, Meijo University
- MP-08 Study of Hammering Device to Put on Multi-copter Targeted for Bridge Floor Slabs
Yuki Abe, Akihiko Ichikawa, Takahiro Ikeda and Toshio Fukuda, Meijo University

- MP-09 Compact 4DOF Robotic Forceps with 3.5 mm in Diameter for Neurosurgery based on a Synthetic Elastic Structure
Yosuke Fujisawa, Kazuo Kiguchi, Kanako Harada, Mamoru Mitsuishi, Makoto Hashizume and Jumpei Arata, Kyushu University
- MP-10 Light Weight Robot Arm on UAV System for Infrastructure Inspection
Satoshi Minamiyama, Kenichi Ohara, Takahiro Ikeda, Akihiko Ichikawa, Satoshi Ashizawa, Takeo Oomichi and Toshio Fukuda, Meijo University
- MP-11 Development of Accuracy Evaluation System for Multi-copter Autonomous Flight
Shogo Yasui, Takahiro Ikeda, Kenichi Ohara, Akihiko Ichikawa and Toshio Fukuda, Meijo University
- MP-12 Development of Wall Climbing Robot using Passive Joint and Vacuum Pad on Rough Surface
Seiji Sano, Kenichi Ohara, Satoshi Ashizawa, Akihiko Ichikawa, Takeo Omichi and Toshio Fukuda, Meijo University
- MP-13 Telebiometric System for Infant and Toddler Fingerprint Recognition
Muhammad Anwar Ma'sum and Wisnu Jatmiko, Faculty of Computer Science Universitas Indonesia
- MP-14 Posture Estimation by Vision Sensor in Environment where GPS can not be used
Jumpei Kishikawa, Kenichi Ohara, Takahiro Ikeda, Akihiko Ichikawa and Toshio Fukuda, Meijo University
- MP-15 Preliminary Design of a Mechanical Transfer Lift for Disabled Patient
Mohammad Azzeim Bin Mat Jusoh, Mohd Taufiq Bin Ismail, Sukarnur Bin Che Abdullah, Helmi Bin Rashid and Hafizan Hashim, Universiti Teknologi MARA (UiTM) Shah Alam
- MP-16 Finger Direction Recognition toward Human-and-robot Cooperative Tasks
Kiichi Nagai, Haruki Sakabe, Takuya Ikai and Masahiro Ohka, Nagoya University
- MP-17 Yeast Surface Displayed Porcine Epidemic Diarrhea (PED) Viral Epitopes and Microfluidic Encapsulation in Ca-Alginate Beads for Oral Vaccination
Ho Won Lee, Da Som Kim, Jong Hyun Lee, Hyuck Ki Kwon, Ga-Young Park, Ji-Young Ahn and Ok Chan Jeong, Inje University

- MP-18 Calcium Signaling Response of Osteoblastic Cells Received with Compressive Stimuli
Koki Yamasaki, Yuta Nakashima, Tairo Yokokura and Yoshitaka Nakanishi, Kumamoto University
- MP-19 A novel Eye Surgery Simulator for Exercising Operation Task of Inner Limiting Membrane Peeling
Seiji Omata, Yusei Someya, Shyun-ya Adachi, Kanako Harada, Mamoru Mitsuishi, Kiyoto Totsuka, Fumiyuki Araki, Muneyuki Takao, Makoto Aihara and Fumihito Arai, Nagoya University
- MP-20 Modeling the Dead-band in Magnetic Actuation
Bilal Tulan and Fumihito Arai, Nagoya University
- MP-21 Fabrication of Hollow Branch Structure without Core by Circumferential Exposure for Vascular Model with Temperature Indicating Function
Hisataka Maruyama, Yuki Yokota, Keisuke Hosono and Fumihito Arai, Nagoya University
- MP-22 Proposal of New Control Parameter for Neck Myoelectric Control-type Electrolarynx
Katsutoshi Oe, Shohei Kokushi and Ryoya Nakamura, Daiichi Institute of Technology
- MP-23 A Novel Eye-Surgery Simulator of Glaucoma Surgery with a Bionic Eye Model
Mahmoud Gallab, Seiji Omata and Fumihito Arai, Nagoya University

Plenary Talks

Chairperson:

- 14:40-15:25 Plenary Talk1
Harnessing Bioengineering Technologies for Better Stem Cell Therapies
Ke Cheng, NC State University & UNC-Chapel Hill, U. S. A
- 15:25-16:10 Plenary Talk2
Thin Artificial Muscles Pioneering New Robotics
Koichi Suzumori, Tokyo Institute of Technology, Japan
- 16:10-16:30 ***Coffee Break***

Session MPI-1: (Organized Session4)
Cytoanalysis and Biomonitoring

Conference Room 1

- Chairperson: *Seiji Omata, Nagoya University*
Taisuke Masuda, Nagoya University
- 16:30-17:00 Micro/nano-scale Needle Devices for the Brain
Takeshi Kawano, Toyohashi University of Technology
- 17:00-17:15 Integrated Micro-displacement Sensor and its Application to
Photoplethysmographic Sensor
Hirofumi Nogami, Ryo Inoue, Yuma Hayashida and Renshi Sawada, Kyushu University
- 17:15-17:30 Microneedles Based Biosensor for Living Cells: A Novel Approach
Ganesh Kumar Mani, Dhivya Ponnusamy, Yutaka Yasoda, Asuka Saito and Kazuyoshi Tsuchiya, Tokai University
- 17:30-17:45 The Topographical Switching of Focal Adhesion Maturation Sites and Actin
Filament Activation on the Well-defined Grid Micropatterns
Katsuko S Furukawa, Chang Ho Seo, Heonuk Jeong, Kevin Montagne and Takashi Ushida, The University of Tokyo
- 17:45-18:00 Adhesion Restriction of Mesenchymal Stem Cells on Nano Check Pattern
Ziyu Chen, Naoya Ishibashi, Kevin Montagne, Katsuko Furukawa and Takashi Ushida, The University of Tokyo
- 18:00-18:15 Real-time in Situ Observation of Immature Bone Tissue Subjected to
Mechanical Loading in Culture
Eijiro Maeda, Katsuhisa Ichikawa, Kohei Murase, Kazuaki Nagayama and Takeo Matsumoto, Nagoya University
- 18:15-18:30 Development of Multi-organs-on-a-chip Mimicking Physiological
Parameters: Evaluation of the Function using Prodrug CPT-11
Tatsuto Ono, Shinji Sugiura, Teruo Fujii, Yasuyuki Sakai and Hiroshi Kimura, Tokai University

Session MP2-1: (Organized Session11)
Intelligent Robot System Control and its application

Conference Room 2

- Chairperson: *Kenichi Ohara, Meijo University*
- 16:30-17:00 Latest Data Processing Technologies for Living State Estimation
Takuo Suzuki, Aichi Prefectural University
- 17:00-17:15 Ambient Scheduler Cue4D Just in Time and Just in Place Associated with Objects
Tomohiro Umetani, Mayuko Ishii and Takashi Takuma, Konan University
- 17:15-17:30 Fruit Mapping Mobile Robot on Simulated Agricultural Area in Gazebo Simulator using Simultaneous Localization and Mapping (SLAM)
Novian Habibie, Aditya Murda Nugraha, Ahmad Zaki Anshori, Muhammad Anwar Ma'sum and Wisnu Jatmiko, Universitas Indonesia
- 17:30-17:45 Paper Handling Task Based on Three-axis Force Distribution of Robotic Fingertips
Yuko Kamishima, Yuya Oizumi, Kenji Sugiman and Masahiro Ohka, Nagoya University
- 17:45-18:00 Pilot Test on Hammering Quality Control of Bridge Inspection by Multi-rotor UAV with One DoF Manipulator
Takahiro Ikeda, Shogo Yasui, Kenichi Ohara, Satoshi Ashizawa, Akihiko Ichikawa, Akihisa Okino, Takeo Oomichi and Toshio Fukuda, Meijo University
- 18:00-18:15 Cooperative Monitoring Multiple Humans using UAVs and Fixed Camera
Yuki Uchibori, Tomohito Takubo, Atsushi Ueno, Kai Cai, Ryusuke Miyamoto and Shinsuke Hara, Osaka City University
- 18:30-19:30 **Beer Party**

December 5 (Tue)

Location: Noyori Conference Hall

Session TAI-1: (Organized Session10)

Micro-Nano Structures and Instrumentation Technology

Conference Room 1

Chairperson: *Masahiro Nakajima, Nakajima Steel Co., Ltd.*
Futoshi Iwata, Shizuoka University

9:00-9:30 Super-resolution Imaging using Electron Beam Excited Nano-sized Spot of Light
Wataru Inami and Yoshimasa Kawata, Shizuoka University

9:30-9:45 Topographical Imaging and Charge Mapping of Charged Surface using Scanning Ion Conductance Microscopy with A Theta Nanopipette
Tatsuru Shirasawa, Yusuke Mizutani, Tatsuo Ushiki and Futoshi Iwata, Shizuoka University

9:45-10:00 Fine Processing of Polymer Surface by Irradiating Local Atmospheric Pressure Plasma Jets using Helium Source Gas Mixed with Water Vapor
Sho Yamamoto, Daisuke Morimatsu, Atsushi Nakamura, Akihisa Ogino, Masaaki Nagatsu and Futoshi Iwata, Shizuoka University

10:00-10:15 All-in-one Bag based Photooxidative Cell Membrane Perforation System for Mass cell processing preparation
Takashi K. Saito, Takahiro Hashimoto, Misato Kikuchi, Takayoshi Ohba, Keiichi Ito, Shigeo Nakamura and Chumei Saito, Akita Prefectural University

10:15-10:30 Effect of Intermittent RIE Etching on the Beta-PVDF Film Micro Patterning
Ryota Sugii, Hirofumi Miki and Shigeki Tsuchitani, Wakayama University

Session TA2-1: (Organized Session12)
Microfluidic platform integrated with optical technologies

Conference Room 2

- Chairperson: *Takeshi Hayakawa, Chuo University*
Takanori Iino, The University of Tokyo
- 9:00-9:30 Fabrication of Glass-based Bio-chip Utilizing Ultrashort-pulse-laser and its Application
Yasutaka Hanada, Hirosaki University
- 9:30-9:45 Time-space Resolved Surface Plasmon Resonance Microscope System for Bio-molecular Reaction Analysis
Yuzuru Iwasaki, Michiko Seyama, Suzuyo Inoue and Katsuyoshi Hayashi, NTT Corporation
- 9:45-10:00 Open-window in Microfluidic Chip with Ultra-thin Glass for Single Cell Isolation by Femtosecond Laser Irradiation
Daichi Fujita, Takanori Iino, Hiroki Hagihara, Yaxiaer Yalikun, Yo Tanaka, Ryohei Yasukuni and Yoichiroh Hosokawa, Nara Institute of Science and Technology
- 10:00-10:15 A Sol-gel Integrated Dual-readout Microarray Platform for Quantification and Identification of Prostate-specific Antigen
SangWook Lee, Jong Hyun Lee, Hyuck Gi Kwon, Thomas Laurell, Ok Chan Jeong and Soyoun Kim, The University of Tokyo
- 10:15-10:30 Imaging Method of Oocyte by using a Micro-scale Rotational Flow
Yaxiaer Yalikun, Yusufu Aishan, Kenta Sumiyama and Yo Tanaka, RIKEN
- 10:30-10:40 **Coffee Break**

Session TAI-2: (Organized Session8)
Embodied-brain Systems Science

Conference Room 1

Chairperson: *Qi An, The University of Tokyo*

- 10:40-11:10 Multisensory Alterations in Visual, Vestibular and Proprioceptive Cues for Modeling of Postural Control
Ryosuke Chiba, Kohei Kaminishi, Kaoru Takakusaki and Jun Ota, Asahikawa Medical University
- 11:10-11:25 Spatial and Temporal Correlation of Muscle Synergies in Human Walk-run Transition
Hiromune Takahashi, Hiroko Oshima, Shinya Aoi, Tetsuro Funato, Nobutaka Tsujiuchi, Akihito Ito and Kazuo Tsuchiya, Doshisha University
- 11:25-11:40 Gait Analysis in Rat with Cerebellar Stroke
Ryutaro Sakai, Tetsuro Funato, Soichiro Fujiki, Meiko Asaka, Shinya Aoi and Dai Yanagihara, The University of Electro-Communications
- 11:40-11:55 Somatosensory Feedback Improves Operability of Extra Robotic Thumb Controlled by Vestigial Muscles
Hiroshi Shikida, Segura Meraz Noel and Yasuhisa Hasegawa, Nagoya University
- 11:55-12:10 Observation of Grasping Style Adaptation due to Artificially-limited Joint Range of Motion of the Thumb
Natsuki Miyata, Reiko Takahashi, Masatoshi Takemura, Koji Fujita and Yusuke Maeda, National Institute of Advanced Industrial Science and Technology

Session TA2-2: (Organized Session6)

Bio Assembler

Conference Room 2

Chairperson: *Masaru Kojima, Osaka University*

10:40-11:10 Fabrication of 3D Tissues using Enzymatic Reactions through Production of Hydrogel Microcapsules and Microfibers
Shinji Sakai, Osaka University

11:10-11:25 A Design Strategy of A Bioreactor for Platelet Production using Fluid Force
Hiroki Kumon, Shinya Sakuma, Sou Nakamura, Koji Eto and Fumihito Arai, Nagoya University

11:25-11:40 Microfluidic Device for Applying a Mechanical Stimulus to a Large Number of Cellular Nuclei
Masahiro Totani, Masaru Kojima, Mitsuhiro Horade, Yasushi Mae, Toshihiko Ogura, Makoto Kaneko and Tatsuo Arai, Osaka University

11:40-11:55 Detection of MRC-5 in Multi-layered Microchannel by Electrical Impedance Spectroscopy
Chit Oo Maung, Xiayi Liu, Daisuke Kawashima, Michiko Sugawara, Hiromichi Obara and Masahiro Takei, Chiba University

11:55-12:10 Improvement of 3D Reconstruction Image by Confocal Microscope with the Cell Rotated
Yuma Takeuchi, Masaru Kojima, Yasushi Mae and Tatsuo Arai, Osaka University

12:10-13:05 **Lunch**

Poster Session II

Poster Area (1st Floor)

Chairperson:

13:05-14:05

- TP-01 Evaluating Motion Capture Accuracy for Gait Analysis
Kazuto Miyawaki, Akito Sato and Satoru Kizawa, National Institute of Technology, Akita College
- TP-02 Wireless Remote Control for a Vibration-Driven Electromagnet-Type Moving Microrobot(Fabrication of Third Prototype Microrobot and Experimental Results for Straight Running and Turning)
Masahiro Isogai, Aichi University of Technology
- TP-03 Vividness Control of KI with Variation in Visual Stimulus Pattern
Hiraku Komura, Shumpei Yoshida, Tomoki Shimura, Masakazu Honda and Masahiro Ohka, Nagoya University
- TP-04 Development of a Novel Wearable MRI-Compatible Finger Assistive Robot
Kun Liu and Yasuhisa Hasegawa, Nagoya University
- TP-05 Micro Folding Structure using Ti-ni-zr High Formable Shape Memory Alloys
Hiroto Watanabe, Mizue Mizoshiri, Seiichi Hata and Junpei Sakurai, Nagoya University
- TP-06 Electrical Stimulation for Compensation of Impaired Lower Limb Sensation
Mengze Li, Tadayoshi Aoyama and Yasuhisa Hasegawa, Nagoya University
- TP-07 Global Path Planning using Modified Firefly Algorithm
Xiaochao Chen, Ming Zhou, Jian Huang and Zhiwei Luo, Huazhong University of Science and Technology
- TP-08 Development of Catheter Grasping Forceps by Metal Injection Molding Fabrications
Makoto Nokata and Takahiro Omori, Ritsumeikan University
- TP-09 Control of Invasion Direction of Cancer Cells using Hierarchically Patterned Hydrogel Sheets
Manami Sugimoto, Yoichi Kitagawa, Yuya Yajima, Rie Utoh, Masumi Yamada and Minoru Seki, Chiba University

- TP-10 3D pH Measurement For Cell Culture using CT Scan
Nobuya Higashino, Toshio Takayama, Hiroaki Ito, Mitsuhiro Horade, Chia-Hung Dylan Tsai and Makoto Kaneko, Osaka University
- TP-11 Seasonal Time Series Exploration using Conditional Probabilistic Graphical Approach
Sumarsih Condroayu Purbarani, Hadaiq Rolis Sanabila and Wisnu Jatmiko, Universitas Indonesia
- TP-12 Simultaneous Observation of Cell Behavior on Substrates with Different Heights
Tsukasa Taniguchi, Mitsuhiro Horade, Hiroaki Ito, Toshio Takayama, Chia-Hung Dylan Tsai and Makoto Kaneko, Osaka University
- TP-13 Experimental Study on Bilateral Control Method with Consideration of Object Rigidity
Mizuki Ando, Seisyou Sakoda, Yusuke Hirama, Woong Choi, Youichi Shigematsu, Nobuto Hirakoso, Hironoshin Kawabata and Tadao Arai, National Institute of Technology, Gunma College
- TP-14 Estimation of Hemiplegia by Gripping Force Distribution
Kento Yamada, Akihiko Ichikawa, Izumi Kondo and Toshio Fukuda, Meijo University
- TP-15 A Study on Optimal Formulation for Multi-Legged Gait Robot with Redundant Joint
Nobuto Hirakoso, Jun'ya Terayama, Naoya Yoshinaga, Ryoichiro Tamura, Tatsuya Hatori, Yusuke Hirama, Woong Choi, Yoichi Shigematsu, Hironoshin Kawabata and Tadao Arai, National Institute of Technology, Gunma College
- TP-16 Measurement of Two- and Three-dimensional Viscoelasticity of Tissue and Artificial Organ
Keisuke Uchida, Akihiko Ichikawa, Akiyuki Hasegawa, Masaru Takeuchi and Toshio Fukuda, Meijo University
- TP-17 Olfactory Cues to Enhance Simultaneous Motor Learning in Opposing Force Fields
Eiko Twinkle Matsuda, Daichi Misawa, Shiro Yano and Toshiyuki Kondo, Tokyo University of Agriculture and Technology

- TP-18 Real-time Microscopic Video Shooting using View Expanded Microscope System
Tadayoshi Aoyama, Mamoru Kaneishi, Takeshi Takaki, Idaku Ishii, Sarau Takeno, Masaru Takeuchi, Jun Nakanishi and Yasuhisa Hasegawa, Nagoya University
- TP-19 Investigating the Relationship between Driver's Sense of Agency and EEG: mu-rhythm is more Suppressed in Higher SoA Case
Sonmin Yun, Wen Wen, Sonmin Yun, Shunsuke Hamasaki, Hiroshi Yamakawa, Yusuke Tamura, Atsushi Yamashita and Hajime Asama, The University of Tokyo
- TP-20 Estimation of Fingertip Force from High-Density Surface Electromyography
Kaori Fujikawa, Shouhei Shirafuji, Becky Su, Enrico Piovanelli and Jun Ota, The University of Tokyo
- TP-21 Pulse Wave Measurement using Wide Range Load Sensor using Quartz Crystal Resonator
Takuya Nishi, Yuichi Murozaki and Fumihito Arai, Nagoya University
- TP-22 Self-Generation of Reward by Human Interaction -Adaptation to Multitask by Reflecting Hope Degree for Priority-
Seiya Shirakura, Takuya Masaki, Masaya Ishizuka and Kentarou Kurashige, Muroran Institute of Technology
- 14:05-14:15 ***Coffee Break***

Plenary Talks

Chairperson:

14:15-15:00 Plenary Talk3
Sugar Chains Modified Nano-carbon Bio-sensors for Host Range Detection of
Influenza Viruses
Toshio Kawahara, Chubu University, Japan

15:00-15:10 ***Coffee Break***

Session TP1-1: (Organized Session16) Human assistive technology

Conference Room 1

Chairperson: *Yasuhisa Hasegawa, Nagoya University*

15:10-15:40 Design of Human Machine Interface based on Understanding of Motor and
Sensory Capacity
Yuichi Kurita, Hiroshima University

15:40-15:55 Auricularis Muscles based Control Interface for Robotic Extra Thumb
*Noel Segura Meraz, Yasuhisa Hasegawa and Hiroshi Shikida, Nagoya
University*

15:55-16:10 Somatosensory Feedback from Fingers Accelerates Body Representation
Update
Takayuki Ito and Yasuhisa Hasegawa, Nagoya University

16:10-16:30 Walking-aid Cane Robot Applying Light Touch Effect
*Masahiro Kato, Akihiko Ichikawa, Izumi Kondo and Toshio Fukuda, Meijo
University*

16:30-16:45 Gait Diagnosis for Elderly People to Prevent Fall and Development of
Training Assist Tool using Augmented Reality
*Shota Okuno, Tomotaka Ito, Mizue Suzuki and Shigeki Tani, Shizuoka
University*

Session TP2-1: (Organized Session2)
Micro-Nano Manipulation and Its Biomedical Applications

Conference Room 2

- Chairperson: *Takeuchi Masaru, Nagoya University*
Tadayoshi Aoyama, Nagoya University
- 15:10-15:25 Construction of Vascular Network in 3D Cellular Structure by using Magnetic Field
Eunhye Kim, Masaru Takeuchi, Akihiko Ichikawa and Toshio Fukuda, Meijo University
- 15:25-15:40 In Vitro Mimic of Hepatic Lobule Tissue using Ca-alginate Cell-containing Hydrogel Modules
Zeyang Liu, Minmin Lu, Masuru Takeuchi, Tao Yue, Yasuhisa Hasegawa, Qiang Huang and Toshio Fukuda, Nagoya University
- 15:40-15:55 Instantaneous Acquisition of Focused Image using High-speed Microscope System
Tadayoshi Aoyama, Motoaki Hanabishi, Takeshi Takaki and Idaku Ishii, Nagoya University
- 15:55-16:10 Magnetic self-assembly of Toroidal Microstructures by Shaking
Masaru Takeuchi, Mamoru Hattori, Akihiko Ichikawa, Toshio Fukuda and Yasuhisa Hasegawa, Nagoya University
- 16:10-16:30 Size Effect on Crack Propagation of Nano-scale Silicon with Different Type of Nothes
Kohei Okada, Shinya Nakamura, Masahiro Nakajima and Taeko Ando, Ritsumeikan University
- 16:30-16:45 Mechanical Characterization of a Single Synechocystis sp. PCC 6803 Cell in Different Osmolarity Solutions
Di Chang, Shinya Sakuma, Kota Kera, Nobuyuki Uozumi and Fumihito Arai, Nagoya University
- 16:45-17:00 A High-efficiency and Clogging-free Microfluidic Device for Size-Selective Cell Separation
Anas Mohd Noor, Taisuke Masuda, Wu Lei, Koji Horio, Toshiki Saito and Yasuhiko Miyata, Nagoya University and University Malaysia Perlis, Malaysia

17:00-17:10 **Coffee Break**

Session TP1-2: (Organized Session5)
Micro-robot, Bio-micro mechatronics and Micro-systems

Conference Room 1

Chairperson:

- 17:10-17:40 Possibilities of Mammalian Cell Preservation using Freeze-dried Methods
Kazutsugu Matsukawa, Kochi University
- 17:40-17:55 Analysis of EHD Pump with Planer Electrodes using FEM Simulation
Yu Kuwajima, Hiroki Shigemune and Shingo Maeda, Waseda University
- 17:55-18:10 Chemotaxis Detection Device of C. Elegans using Capacitance Sensor
Yuya Baba, Akihiko Ichikawa, Masahiro Nakajima and Toshio Fukuda, Meijo University
- 18:10-18:25 Transparent Printhead for Transporting Multiple Micro-droplets
Kentaro Tanagi, Sho Kawaharada, Shota Hiratsuka, Takayuki Shibata and Moeto Nagai, Toyohashi University of Technology
- 18:25-18:40 Eyeball Deformation by Organ Pressure Regulation using Magnetic Sheet
Akio Aso, Kaoru Uesugi, Hiroyuki Kanda, Takashi Fujikado and Keisuke Morishima, Toyohashi University of Technology

Session TP2-2: (Organized Session7)
Cognitive Robotics

Conference Room 2

Chairperson: *Naoyuki Kubota, Tokyo Metropolitan University*

- 17:10-17:40 Unsupervised Neural Network based Topological Learning from Point Clouds
for Map Building
Wei Hong Chin and Naoyuki Kubota, Tokyo Metropolitan University
- 17:40-17:55 Development of Motion Capture System using Multiple Depth Sensors
Ryuichiro Sakata, Futoshi Kobayashi and Hiroyuki Nakamoto, Kobe University

- 17:55-18:10 Perception and Action Cycle for Cognitive Robotics
Hiroyuki Masuta, Tatsuo Motohoshi, Kei Sawai, Ken'ichi Koyanagi and Toru Oshima, Toyama Prefectural University
- 18:10-18:25 A Study on the Effect of Vibration Stimulation Phase to Knee Joint Extension Motion Change for Perception-assist
Koki Honda and Kazuo Kiguchi, Kyushu University
- 18:25-18:40 A Study of Dynamically Adjustment for Exploitation Action using Evaluation of Achievement
Masashi Sugimoto and Kentarou Kurashige, National Institute of Technology Kagawa College
- 19:00-21:00 ***Reception***

December 6 (Wed)

Location: Noyori Conference Hall

Session WA1-1: (Organized Session 13)

Functional Interfaces and Hydro-Electrochemical Mechatronics

Conference Room 1

Chairperson: *Yoko Yamanishi, Kyusu University*

9:00-9:30 Micro-vibration Actuators Driven by Shape-memory Alloy Wires and its Application to Tactile Displays
Hideyuki Sawada, Waseda University

9:30-9:45 Simultaneous Printing of Multiple Origami Structures
Hiroki Shigemune, Shingo Maeda, Shuji Hashimoto and Shigeki Sugano, Waseda University & Shibaura Institute of Technology

9:45-10:00 Optical Transfection System using Pulse Laser for Massively Parallel Localized Intracellular Delivery
Keisuke Funahashi, Shin Sawai, Tuhin Subhra Santra, Takayuki Shibata and Moeto Nagai, Toyohashi University of Technology

10:00-10:15 Non-contact Wettability Assessment for Detecting Cellular Behaviors
Nobuyuki Tanaka, Junko Takahara, Akane Awazu, Yoshihide Haruzono, Hiromitsu Nasu and Yo Tanaka, RIKEN

10:15-10:30 Liquid Junction Potential in the pH Measurement and Microfluidic pH Measurement Device using ISFET Sensor
Akira Yamada and Miho Suzuki, Aichi Institute of Technology

10:30-10:45 Fundamental Study on Electrically-Induced Bubble Catalytic Plating Technology
Yudai Fukuyama, Keita Ichikawa, Shingo Maeda and Yoko Yamanishi, Kyushu University

Session WA2-1: (Organized Session 9)
Human Interface and Multimodal Interaction

Conference Room 2

Chairperson: *Jaeryoung Lee, Chubu University*

9:00-9:30 Design Framework of Robot-assisted Therapy for Children with Autism
Min-Gyu Kim, Korea Institute of Robot and Convergence

9:30-9:45 Design of a Smart Support System Architecture Focusing on the User Activity
Nicholas Bastos Melo and Jaeryoung Lee, Chubu University

9:45-10:00 Energy Consumption Evaluation of a Lower Limb Active Orthosis using
Stochastic Analysis
*Kassio Janielson Eugenio, Pablo Javier Alsina, Vanessa Gabriela Moraes
and Nicholas Bastos Melo, UFRN*

10:00-10:15 4-D Space Visualization with Hidden Hypersurface Removal
Takanobu Miwa, Yuki Nakai and Shuji Hashimoto, Waseda University

10:15-10:30 Ground Contact Detection of Robot Legs by Discriminating Angular
Velocities and Motor Current
Kei Adachi and Yasunori Nagasaka, The Chubu University of Aichi

10:45-11:00 **Coffee Break**

Plenary Talks

Chairperson:

11:00-11:45 Plenary Talk4
High-speed Atomic Force Microscopy: a Tool for Visualizing Dynamic
Behaviors from Proteins to Cells
Takayuki Uchihashi, Nagoya University

11:45-12:10 **Award Ceremony**

12:10-13:30 ***Lunch***

13:30-15:00 ***Laboratory Tour (at Nagoya University)***