

Advanced Program

November 22 (Fri.)

Plenary Talks for CBS2024 (Participants of MHS2024 can attend.) **Room 1**

Chairperson: *Shinjiro Umezu, Chuo University*

9:00-9:45 Plenary Talk
Biological Actuators for Soft Robotics
Prof. Ritu Raman
Massachusetts Institute of Technology, USA

Chairperson: *Fumihito Arai, The University of Tokyo*

9:45-10:30 Plenary Talk
Biohybrid Robotics
Prof. Shoji Takeuchi
The University of Tokyo, Japan

Chairperson: *Yasuhisa Hasegawa, Nagoya University*

10:45-11:30 Plenary Talk
Bioinspired Bionic Limbs: From Embodied Intelligence to Neural Control
Prof. Cristina Piazza
Technical University Munich, Germany

11:30-12:00 **Award ceremony**

13:00-14:15 **Lab tour**

Opening Remarks

Room 1

Chairperson: *Fumihito Arai, The University of Tokyo*

14:15-14:30 *Prof. Toshio Fukuda, Nagoya University (Honorary Chair)*
Prof. Fumihito Arai, The University of Tokyo (General Chair)

Plenary Talks

Room 1

Chairperson: *Hisataka Maruyama, Nagoya University*

14:30-15:15 Plenary Talk 1
Lab-on-a-Chip Systems for Personalized Medicine [PL1](#)
Prof. Yoon-Kyoung Cho
Ulsan National Institute of Science and Technology (UNIST), Korea

Advanced Program

Plenary Talks

Room 1

Chairperson: *Tadayoshi Aoyama, Nagoya University*

15:15-16:00 Plenary Talk 2
Soft Sensors and Actuators Using Magnetic Responsive Elastomers... [PL2](#)
Prof. Mitsuhiro Kamezaki
The University of Tokyo, Japan

16:00-16:15 **Break**

Plenary Talks

Room 1

Chairperson: *Seiichi Hata, Nagoya University*

16:15-17:00 Plenary Talk 3
Ultraflexible/Stretchable Electronics for BMI Technologies [PL3](#)
Prof. Tsuyoshi Sekitani
Osaka University, Japan

17:00-17:30 **Break**

17:30-19:30 **MHS & CBS Joint Party**
Venue: 8th Floor, Emergent/Innovative Engineering Building

Advanced Program

November 23 (Sat.)

Session SaA1-1: (Organized Session 5):

Functional Interfaces and Hydro-Electrochemical Mechatronics

Room 1

Chairpersons: *Yoko Yamanishi, Kyusyu University*
Shingo Maeda, Institute of Science Tokyo

9:00-9:15 High-Speed Fluidic Rolling Robot Utilizing Functional Liquid and Air:
Design, Modeling, and Characterization [SaA1-1-1](#)
Zebing mao
Faculty of Engineering, Yamaguchi University

9:15-9:30 Design Optimization of Resilient EHD Pumps [SaA1-1-2](#)
Amr Marzuq, Yu Kuwajima, Yuhei Yamada, Shingo Maeda
Mechanical Engineering Department, Institute of Science Tokyo

9:30-9:45 Fabrication of a Dielectric Elastomer Actuator Made of an Organogel by
using a 3D Printing [SaA1-1-3](#)
Masato Higuchi, Takeshi Hayakawa
Department of Precision engineering, Chuo University

9:45-10:00 Characterization of Three-dimensional Gold Nanoparticle Assemblies for
Optical Biosensor Applications [SaA1-1-4](#)
Ryuta Tetsuya¹, Maasa Yokomori¹, Miho Tagawa², Yoko Yamanishi¹
¹Department of Mechanical Engineering, Kyusyu University, ²Institute of
Materials and Systems for Sustainability (IMaSS), Nagoya University

10:00-10:30 Keynote Talk 1
Bio-Integrated Flexible Electronics for Directing Living Body [KE1](#)
Toshinori Fujie
School of Life Science and Technology, Institute of Science Tokyo

Session SaA2-1: (Organized Session 1)

Advanced Micro-Nano Systems for Biomedical Applications

Room 2

Chairperson: *Hisataka Maruyama, Nagoya University*

9:00-9:15 A Magnetic Actuation Method for Endoscopic Submucosal Dissection
using Self-transformable Wireless flexible Microtool [SaA2-1-1](#)
Bolan Zhang, Tengo Shu, Yuxuan Liu, Toshiro Yamanaka, and Fumihito
Arai
Department of Mechanical Engineering, Graduate School of Engineering,
the University of Tokyo

Advanced Program

- 9:15-9:30 Design and Evaluation of a Highly Deformable Pneumatic Actuator with Stiffness Anisotropy [SaA2-1-2](#)
Kento Kawafuku, Hisataka Maruyama
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
- 9:30-9:45 Study of Mechanical behavior during incision for glaucoma practice [SaA2-1-3](#)
Seiji Omata¹, Yuki Hata¹, Toshiro Yamanaka², Kanako Harada², Mamoru Mitsuishi⁴, Takahiro Arai³, Takashi Ueta³, Koichiro Sugimoto³, Tomoyasu Shiraya³, Muneyuki Takao³, Makoto Aihara³, Yasuyuki Morita¹, Fumihito Arai²
¹Faculty of Advanced Science and Technology, Kumamoto University
²Department of Mechanical Engineering, The University of Tokyo
³Department of Ophthalmology, The University of Tokyo
⁴Advanced Comprehensive Research Organization, Teikyo University
- 9:45-10:00 Robotic micromanipulation system for electrophysiology experiments using oocyte [SaA2-1-4](#)
Kazusa Otani¹, Hiroataka Sugiura¹, Turan Bilal¹, Satoshi Amaya¹, Shunya Saito¹, Nobuyuki Uozumi², Fumihito Arai¹
¹Department of Mechanical Engineering, Graduate School of Engineering, The University of Tokyo
²Department of Biomolecular Engineering, Graduate School of Engineering, Tohoku University
- 10:00-10:15 Light-Controlled Variable-Stiffness Microgripper For Manipulating Micro Object [SaA2-1-5](#)
Yoshikatsu Yamaguchi, Takayuki Hoshino, Hisataka Maruyama
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
- 10:15-10:30 Development of Cell Membrane Perforator for Large-Scale Application of Photochemical Cell Membrane Perforation by Continuous Processing [SaA2-1-6](#)
Sota Ochiai¹, Kohei Kobayashi¹, Takashi Kei Saito²
¹Department of Integrated System Engineering, Akita Prefectural University Graduate School of Systems Science and Technology
²Department of Intelligence Mechatronics, Faculty of Systems Science and Technology, Akita Prefectural University
- 10:30-10:45 Fabrication of high formable shape memory alloy micro pillar by thermal nanoimprint [SaA2-1-7](#)
Koyo Izumi, Ryusuke Shibagaki, Chiemi Oka, Seiichi Hata, Junpei Sakurai
Graduate School of Engineering, Nagoya University

Advanced Program

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

Session SaA1-2: (Organized Session 2):

Cutting-edge sensors and actuators utilizing micro-nano science

Room 1

Chairpersons: *Hirota Sugiura, The University of Tokyo*
Kazuyoshi Tsuchiya, Tokai University
Taisuke Masuda, The University of Tokyo

11:00-11:30 Keynote Talk 2
Kinetic electronics based soft micro robots toward bio/chemical application
..... [KE2](#)

Fumihito Sassa
Kyushu University

11:30-11:45 Development of Oral Sensor Based on Amine Film Formed on a Gold Surface for Sensing Bicarbonate Ion in Saliva [SaA1-2-2](#)
Suwu Han¹, Kazuma Sasaki¹, Jyoti Jaiswal^{2,3} and Kazuyoshi Tsuchiya^{1,2}
¹Department of Mechanical Engineering, Tokai University
²Micro/Nano Technology Center, Tokai University
³Centre for Advanced Research, Department of Physics, Rajiv Gandhi University

11:45-12:00 A 6-DoF Miniature Variable Stiffness Device based on Magneto-rheological Fluid for Assisting Mechanical Coupling in Modular Robotic System [SaA1-2-3](#)
Masato Higuchi, Takeshi Hayakawa
Department of Precision engineering, Chuo University

12:00-12:15 Compact moving mechanism using ER fluid and piezoelectric element
..... [SaA1-2-4](#)
Takeshi Inoue, Daiki Oguchi, Akihiro Torii, Suguru Mototani, Kae Doki
Department of Electrical and Electronic Engineering, Aichi Institute of Technology

12:15-12:30 Design and analysis of the multi-axis QCR force sensor accounting for the interdimensional coupling effect [SaA1-2-5](#)
Hirota Sugiura, Satoshi Amaya, Fumihito Arai
Department of Mechanical Engineering, Graduate School of Engineering, The University of Tokyo

Session SaA2-2: (Organized Session 8)

Machine-fluid interactions in microscale

Room 2

Chairperson: *Takeshi Hayakawa, Chuo University*

11:00-11:15 Rapid Cell Spheroid Formation and Patterning Based on Vibration-Induced Flow and Faraday Waves [SaA2-2-1](#)

Advanced Program

Ryutaro TOYOSHIMA, Takeshi HAYAKAWA

Department of Precision engineering, Chuo University

- 11:15-11:30 Vision-based Microfluidic Chip for Manipulation of Multiple Objects in Sequence [SaA2-2-2](#)
Shuzhang Liang, Kenji Takeda, Yuxuan Liu, Rixin Wang, Hao Mo, Yuguo Dai, Satoshi Amaya, Hirotaka Sugiura, Fumihito Arai
Department of Mechanical Engineering, Graduate School of Engineering, The University of Tokyo
- 11:30-11:45 Fabrication of an acoustic lens towards high-power acoustic cell manipulations [SaA2-2-3](#)
Souta Kurihara and Takeshi Hayakawa
Department of Precision Engineering, Chuo University
- 11:45-12:00 Flow Cytometry with Two-point Detection toward High-speed On-chip Multi-sorting [SaA2-2-4](#)
Makoto Saito¹, Yoko Yamanishi¹, Yoshitaka Shirasaki², Shinya Sakuma¹
¹Department of Mechanical Engineering, Kyushu University
²Research Center for Advanced Science and Technology, The University of Tokyo
- 12:00-12:30 Keynote Talk 3
Non-reciprocity in micro-machine hydrodynamics [KE3](#)
Kenta Ishimoto
Kyoto University

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

Session SaP: Poster Session

13:30-14:30

- SaP-01 Bio-Integrated Flexible Electronics for Directing Living Body [SaP-01](#)
Toshinori Fujie
School of Life Science and Technology, Institute of Science Tokyo
- SaP-02 Improvement of pose estimation accuracy for bulk-piled objects based on grasping quality [SaP-02](#)
Ryotaro Yoshida, Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University
- SaP-03 Effective Pose Estimation with Removing Negative Impact Surface Based on the Next Viewpoint Estimation [SaP-03](#)

Advanced Program

Tomoki Mizuno, Tsuyoshi Tasaki

Graduate School of Science and Technology, Meijo University

- SaP-04 Enhancing Disturbance-Rejection Performance of Wheeled Inverted Pendulum Systems with Knee-Wheel Integrated Control SaP-04
Zhiyuan Di¹, Yu Cao², SongHao Li¹, Jian Huang¹
¹School of Artificial Intelligence and Automation, Huazhong University of Science and Technology
²School of Electronic & Electrical Engineering, University of Leeds,
- SaP-05 Fabrication Process Technology to Realize Two-layer Thick Structures Using SU-8 3050 Applicable to the Casting Mold of Microneedle Devices SaP-05
Yusuke Yamamoto, Rina Kusushita, Hirofumi Miki
Graduate School of Systems Engineering, Wakayama University
- SaP-06 The effects of Injection Molding Temperature on Mechanical Properties of Poly (lactic acid)/Poly (butylene succinate) Blend Polymers SaP-06
Ko Umeno¹, Seiichi Sugimoto², Takanobu Tamiya², Takuo Suzuki², Satoshi Kobayashi³
¹Creative Engineering Course, Tokyo Metropolitan College of Industrial Technology
²Monozukuri Engineering Department, Tokyo Metropolitan College of Industrial Technology
³Department of Mechanical Systems Engineering, Faculty of Systems Design, Tokyo Metropolitan University
- SaP-07 Effects of Applied Load Direction to the Output Behavior of Piezoelectric Fingerprint Sensor SaP-07
Jippo Kai, Hirofumi Miki
Graduate School of System Engineering, Wakayama University
- SaP-08 Piezoelectric PVDF Wet Etching Using Polar Solvents as the Etchant SaP-08
Riko Yoshida, Hirofumi Miki
Graduate School of System Engineering, Wakayama University
- SaP-09 Study of improving the strength and porosity of HA/ β -TCP composites by changing the water contents in HHP synthesis SaP-09
Kazuki Osonoi¹, Seiichi Sugimoto², Takanobu Tamiya², Takuo Suzuki², Satoshi Kobayashi³
¹Creative Engineering Course, Tokyo Metropolitan College of Industrial

Advanced Program

Technology

²*Monozukuri Engineering Department, Tokyo Metropolitan College of Industrial Technology*

³*Department of Mechanical Systems Engineering, Faculty of Systems Design, Tokyo Metropolitan University*

- SaP-10 Proposal of Air Supply Systems for Patients on Respiratory Management to Re-generate Their Voice by Applying a Vacuum Ejector [SaP-10](#)
Katsutoshi Oe¹, Hiroki Aoi¹, Mutsuhiro Nakashige², Ryota Shibusawa³, Shunji Uchimura³
¹*Department of Mechanical & Electrical Engineering, Nippon Bunri University*
²*Department of Informatics, Shonan Institute of Technology*
³*Department of Informatics, AI, Data Science, Daiichi Institute of Technology*
- SaP-11 Electrophoresis Velocity Difference Between T4 and λ DNA Molecules that Migrate in a Hydrated Polymer Brush Investigated using Neutron Reflectometry [SaP-11](#)
Hongdong Yi¹, Shintaro Itoh^{1,2}, Kenji Fukuzawa¹, Naoki Azuma¹, Hedong Zhang³
¹*Department of Micro-Nano Mechanical Science and Engineering, Nagoya University*
²*PRESTO, Japan Science and Technology Agency, Japan*
³*Department of Complex Systems Science, Nagoya University*

Session SaP1-1: (Organized Session 4-1)

Emerging technologies for designing communications among cells

Room 1

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

- 14:30-15:00 Keynote Talk 4
Designed cell-cell communication harnessing orthogonal gene switches, CRISPR-Cas and plant-based signaling system [KE4](#)
Shigeo S. Sugano
National Institute of Advanced Industrial Science and Technology
- 15:00-15:15 DNA Nanopore Switch to Reduce the Activity of Jurkat Cells .. [SaP1-1-2](#)
Yukihiro Izawa, Hiromu Akai, and Kan Shoji
Department of Mechanical Engineering, Nagaoka University of Technology

Advanced Program

- 15:15-15:30 Signal Conversion and Amplification Utilizing DNA-functionalized Nanoparticles for miRNA detection [SaP1-1-3](#)
Maasa Yokomori and Yoko Yamanishi
Department of Mechanical Engineering, Faculty of Engineering, Kyushu University
- 15:30-15:45 Continuous Disassembling of Cell-Aggregates in a Microfluidic Chip Fabricated by 3D Printing [SaP1-1-4](#)
Niko Kimura¹ and Shinya Sakuma²
¹Division of Advanced Mechanical Systems Engineering, Institute of Engineering, Tokyo University of Agriculture and Technology
²Department of Mechanical Engineering, Faculty of Engineering, Kyushu University
- 15:45-16:00 Imaging of the engineered cell elimination system for cell therapy [SaP1-1-5](#)
Satoshi Yoshimoto¹, Zhuohao Yang², Yoshitaka Shirasaki², Satoshi Yotsumoto³, Kosuke Dodo¹
¹RIKEN
²University of Tokyo
³Tokyo University of Pharmacy and Life Sciences
- 16:00-16:15 Improvement of Temperature Characteristics of Single Cell Pipetting System [SaP1-1-6](#)
Nariaki Kiyama¹, Makoto Saito¹, Yoshitaka Shirasaki², Mai Yamagishi³, Yoko Yamanishi¹, and Shinya Sakuma¹
¹Kyushu University
²The University of Tokyo
³Live Cell Diagnosis, Ltd.

Session SaP2-1: (Organized Session 7-1)

Intelligent Robot Systems

Room 2

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

- 14:30-14:45 Deep Learning-Powered AMR Interface Capable of Differentiating Static and Dynamic Gestures [SaP2-1-1](#)
Tatsuki Fukaya¹, Takahiro Ikeda², Satoshi Ueki², Hironao Yamada²
¹Dept. of Intelligence Science and Engineering, Gifu University
²Dept. of Mechanical Engineering, Gifu University
- 14:45-15:00 Field-of-View Effects on Depth Perception in Peripheral Space of Teleoperated Robot [SaP2-1-2](#)
Sho Hatano¹, Yaonan Zhu², Tadayoshi Aoyama¹, Yasuhisa Hasegawa¹
¹Department of MicroNano Mechanical Science and Engineering, Nagoya

Advanced Program

University

²School of of Engineering, The University of Tokyo, Tokyo

15:00-15:15 Improving pose estimation of simple-shaped objects by using grasping position estimation SaP2-1-3
Junya Ueda and Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University

15:15-15:30 Development of a method for detecting disorganized products for arrangement in retail store using time-series images SaP2-1-4
Kenta Taniguchi, Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University

15:30-15:45 YOLO Detection Enhancement through Latent Space Template Search SaP2-1-5
Songtao Liu¹, Yaonan Zhu², Tadayoshi Aoyama¹, Masayuki Nakaya³ and Yasuhisa Hasegawa¹
¹Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
²The School of Engineering, The University of Tokyo
³System Dept., Robot Division, NACHI-FUJIKOSHI CORP.

15:45-16:15 Keynote Talk 5
Evolutionary Computation Applied to Image Processing and Hand-Eye Calibration KE5
Junya Sato
Gifu University

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

Session SaP1-2: (Organized Session 4-2)

Emerging technologies for designing communications among cells

Room 1

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

16:30-17:00 Keynote Talk 6
Plant-on-a-chip: Methods for Studying Plant Growth and Development KE6
Hiroataka Hida
Kobe University

Advanced Program

- 17:00-17:15 Core-Driven Pinch-Off Dynamics in Microfluidic Double Emulsions [SaP1-2-2](#)
Chia-Hung Dylan Tsai¹, Shih-Hsiang Weng¹ and Shinya Sakuma²
¹*Department of mechanical Engineering, National Yang Ming Chiao Tung University*
²*Department of Mechanical Engineering, Kyushu University*
- 17:15-17:30 Separation of target white blood cells from a whole blood sample through micropillar arrays [SaP1-2-3](#)
Naotomo Tottori¹, Akira Matsuda¹, Satoshi Yotsumoto², Shinya Sakuma¹, and Yoko Yamanishi¹
¹*Department of Mechanical Engineering, Faculty of Engineering, Kyushu University*
²*School of Life Sciences, Tokyo University of Pharmacy and Life Sciences*
- 17:30-17:45 Live-cell imaging of secretion activity (LCI-S) enables the real-time imaging of instantaneous SASP secretions at a single-cell level [SaP1-2-4](#)
Kan Omura¹, Loo Tze Mun², Zhuohao Yan³, Nobutake Suzuki³, Takashi Funatsu⁴, Mai Yamagishi⁴, Yoshitaka Shirasaki³ and Akiko Takahashi²
¹*Graduate School of Pharmaceutical Sciences, The University of Tokyo*
²*Japanese Foundation for Cancer Research*
³*RCAST, The University of Tokyo*
⁴*Live Cell Diagnosis, Ltd.*
- 17:45-18:00 Single-cell pipette utilizing on-chip pump of spiral-microchannel driven by a piezoelectric actuator [SaP1-2-5](#)
Yasunori Tanabe¹, Nariaki Kiyama¹, Yoko Yamanishi¹, Yoshitaka Shirasaki², Shinya Sakuma¹
¹*Department of Mechanical Engineering, Kyushu University*
²*Research Center for Advanced Science and Technology, The University of Tokyo*
- 18:00-18:15 Generating cancer cell spheroids with highly controllable sizes by a bioprinter [SaP1-2-6](#)
Xueping YU, Yuto SUGIYAM and Takeshi HAYAKAWA
Department of Precision Engineering, Chuo University

Session SaP2-2: (Organized Session 7-2)

Intelligent Robot Systems

Room 2

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

- 16:30-16:45 Stable horizontal flight Control of a multi-copter with transformation mechanism [SaP2-2-1](#)
Matsutomo Inoue¹, Takahiro Suzuki¹, Kenichi Ohara²

Advanced Program

¹Department of Mechatronics Engineering, Graduate of Science and Technology, Meijo University

²Department of Mechatronics Engineering, Faculty of Science and Technology, Meijo University

- 16:45-17:00 Obstacle Detection using Monocular Depth and 3D Map in Adverse Weather Conditions [SaP2-2-2](#)
Naoki Fukuta, Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University
- 17:00-17:15 Locomotion Learning in a Musculoskeletal System through Reinforcement Learning of Joint Actions and LSTM Learning of Muscle Actions [SaP2-2-3](#)
Laurie Azoulay, Kyo Kutsuzawa, Dai Owaki and Mitsuhiro Hayashibe
Dept. of Robotics, Graduate School of Engineering, Tohoku University
- 17:15-17:30 Camera and 3D map registration using 2D feature points trained by 3D feature points [SaP2-2-4](#)
Masato Ueda, Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University
- 17:30-17:45 Noise removal for 3D map by using a super-resolution image [SaP2-2-5](#)
Kansuke Kobayashi, Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University
- 17:45-18:15 Keynote Talk 7
Robot software framework to support the service robot system development [KE7](#)
Kenichi Ohara
Meijo University

Advanced Program

November 24 (Sun.)

Invited Talks

Room 1

Chairperson: *Shintaro Ito, Nagoya University*

9:15-9:45 Invited Talk 1
Single cell analysis based on microfluidic flow control: Achievements & Beyond [IN1](#)
Shinya Sakuma
Department of Mechanical Engineering, Kyushu University

Invited Talks

Room 2

Chairperson: *Yuki Funabara, Nagoya University*

9:15-9:45 Invited Talk 2
Pioneering Macro-Micro Interaction Systems with Intelligent Media, AI, and Robotics [IN2](#)
Tadayoshi Aoyama
Department of Mechanical Systems Engineering, Nagoya University

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

Session SuA1-1: (Organized Session 6)

In-body Cybernetic Avatars

Room 1

Chairperson: *Fumihito Arai, The University of Tokyo*

10:00-10:30 Keynote Talk 8
In-body Cybernetic Avatar and AI [KE8](#)
Kensaku Mori
Graduate School of Informatics, Nagoya University
Information Technology Center, Nagoya University
Research Center for Medical Big Data, National Institute of Informatics

10:30-10:45 Development of Safe and Affordable Ingestible Thermometer as Capsule-Type In-body Cybernetic Avatar [SuA1-1-2](#)
Shinya Yoshida, Hiroshi Miyaguchi
College of Engineering, Shibaura Institute of Technology

10:45-11:00 Performance Evaluation on 2-dimensional In-Body CA Localization Based on Magnetic Fields [SuA1-1-3](#)
Junpei Tsuchida¹, Takumi Kobayashi¹, Shinya Yoshida², Hiroshi Miyaguchi², Daisuke Anzai¹
¹Graduate School of Engineering, Nagoya Institute of Technology
²College of Engineering, Shibaura Institute of Technology

Advanced Program

- 11:00-11:15 System to support gastrointestinal endoscope by separate module from the tip [SuA1-1-4](#)
Tengo Shu¹, Toshiro Yamanaka¹, Kenji Takeda¹, Yoichi Haga², Yosuke Tsuji³, Mitsuhiro Fujishiro³, Fumihito Arai¹
¹Department of Mechanical Engineering, the University of Tokyo
²Graduate School of Biomedical Engineering, Tohoku University
³Department of Gastroenterology, the University of Tokyo
- 11:15-11:30 Traction Cybernetic Avatar System for Colon ESD [SuA1-1-5](#)
Xinchi Gao¹, Noriko Tsuruoka², Wenrui Liu¹, Yuto Sakaguchi³, Yosuke Tsuji⁴, Mitsuhiro Fujishiro⁴, Fumihito Arai⁵, Yoichi Haga^{1,2}
¹Graduate School of Biomedical Engineering, Tohoku University
²Graduate School of Engineering, Tohoku University
³School of Engineering, Tohoku University
⁴Graduate School of Medicine, The University of Tokyo
⁵Graduate School of Engineering, The University of Tokyo
- 11:30-11:45 Reversible Control of Young's Modulus in Hydrogels through Anti-Drying Coatings and Moisture Regulation [SuA1-1-6](#)
Du Jinhao¹, Hisataka Maruyama²
¹Department of Mechanical Systems Engineering, Nagoya University
²Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
- 11:45-12:00 Head-Movement Controlled Colonoscope Interface with Head-Mounted Display for Simplified the Pan and Tilt Operation [SuA1-1-7](#)
Teruaki Ito¹, Tadayoshi Aoyama¹, Kenta Yokoe¹, Takeshi Yamamura², Mio Hiramatsu², Hiroki Kawashima², Masaru Takeuchi¹ and Yasuhisa Hasegawa¹
¹Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
²Department of Gastroenterology and Hepatology, Nagoya University,

Session SuA2-1: (Organized Session 3)

Cutting-edge Technologies for Sustaining Health and Wellness in the Elderly **Room 2**

Chairpersons: *Hisataka Maruyama, Nagoya University*

- 10:00-10:15 Hand Grip Assessment Device for Frailty Detection in Walking Support Device [SuA2-1-1](#)
Shu Moriyama, Kouki Mori, Hisataka Maruyama
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University,

Advanced Program

- 10:15-10:30 Recording and Reproduction of Brush Strokes in Virtual Haptic Calligraphy System [SuA2-1-2](#)
Yutaka Ishibashi¹ and Pingguo Huang²
¹*Faculty of Business Administration, Aichi Sangyo University*
²*Faculty of Economics and Information, Gifu Shotoku Gakuen University*
- 10:30-10:45 Introduction of haptic sense to metaverse with audio, visual, and olfactory senses [SuA2-1-3](#)
Pingguo Huang¹ and Yuataka Ishibashi²
¹*Gifu Shotoku Gakuen University*
²*Aichi Sangyo University*
- 10:45-11:15 Keynote 9
Improving Plasma Skimming in Hydrodynamically Levitated Rotary Blood Pump with Spiral Groove Bearing Design [KE9](#)
Jiang Ming
Institute of Science Tokyo
- 11:15-11:45 Keynote 10
Multisensory ICT-Based System for Early Detection, Prevention, and Recovery Support of Frailty [KE10](#)
Yutaka Ishibashi
Aichi Sangyo University
- 12:00-13:00 **Lunch**

Session SuP1-1: (Organized Session 9)

Micro/Nano Functional Devices for in vivo/vitro applications

Room 1

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

- 13:00-13:30 Keynote Talk 11
Development of a new treatment for intractable paralysis combining xenotransplantation and functional devices with advanced control technology [KE11](#)
Sota Saeki
Department of Human Enhancement and Hand Surgery, Nagoya University Graduate School of Medicine
- 13:30-13:45 Image Presentation System that Considers Ambiguity in Semantic Segmentation to Facilitate the Detection of Polar Bodies in ICSI [SuP1_1_2](#)
Hayato Hagiwara¹, Tadayoshi Aoyama¹, Yuichiro Hayashi², Kensaku Mori², Kazuki Hano³, Masaki Takasu³, Masaru Takeuchi¹, Yasuhisa

Advanced Program

Hasegawa¹

¹Department of Micro-Nano Mechanical Science and Engineering, Nagoya University

²Department of Intelligent Systems, Nagoya University

³Institute for Advanced Study, Gifu University

- 13:45-14:00 Smooth pipette-tool insertion for the single cell pickup using piezoelectric impact driving mechanism [SuP1-1-3](#)
Hiroki Kunii, Hirotaka Sugiura, Satoshi Amaya, Fumihito Arai
Department of Mechanical Engineering, Graduate School of Engineering, The University of Tokyo
- 14:00-14:15 Implantable Functional Electrical Stimulation (FES) Devices for Joint Motion Control: Enhancing Power Delivery using Coupled Resonant Circuit Theory [SuP1_1_4](#)
Masaru Takeuchi¹, Koki Nakayama¹, Katsuhiko Tokutake², Tadayoshi Aoyama¹, Hitoshi Hirata² and Yasuhisa Hasegawa¹
¹Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
²Department of Human Enhancement and Hand Surgery, Nagoya University
- 14:15-14:30 Development of a Multi-DOFs Biohybrid Robot by using 3D Tissue Engineered Skeletal Muscles [SuP1_1_5](#)
Eunhye Kim, Masaru Takeuchi, Yasuhisa Hasegawa, and Toshio Fukuda
Department of Micro-Nano Mechanical Science and Engineering, Nagoya University
- 14:30-14:45 Thermal design of deployable soft actuator with water circulation and shape memory polymer [SuP1_1_6](#)
Toshiro Yamanaka, Taosong Yu and Fumihito Arai
Department of Mechanical Engineering, the University of Tokyo

Session SuP2-1: Regular Session

Room 2

Chairperson: *Hirotaka Sugiura, The University of Tokyo*

- 13:00-13:15 An Automated Product Arrangement System based on Grasp Pose Estimation on Anomaly Area [SuP2_1_1](#)
Ryota Kondo, Tsuyoshi Tasaki
Graduate School of Science and Technology, Meijo University
- 13:15-13:30 Deep Transfer Learning Feature Concatenation for Exam Cheating Detection Based on Footage Camera Recordings [SuP2_1_2](#)
Riskyana Dewi Intan Puspitasari, Fadhillah Qalbi Annisa, Elly Matul Imah
Department of Data Science, Universitas Negeri Surabaya

Advanced Program

- 13:30-13:45 Embedded Image-to-Image Translation for Efficient Sim-to-Real Transfer in Learning-based Robot-Assisted Soft Manipulation [SuP2_1_3](#)
Jacinto Colan¹, Keisuke Sugita¹, Ana Davila², Yutaro Yamada¹ and Yasuhisa Hasegawa²
¹Dept. of Micro-Nano Mechanical Science and Engineering, Nagoya University
²Institutes of Innovation for Future Society, Nagoya University
- 13:45-14:00 Voice control interface for surgical robot assistants [SuP2_1_4](#)
Ana Davila¹, Jacinto Colan² and Yasuhisa Hasegawa¹
¹Institutes of Innovation for Future Society, Nagoya University
²Dept. of Micro-Nano Mechanical Science and Engineering, Nagoya University
- 14:45-15:00 **Break**
- Plenary Talks** **Room 1**
Chairperson: Takahiro Nitta, Gifu University
- 15:00-15:45 Plenary Talk 4
Engineering nanorobots with biomolecular motors [PL4](#)
Henry Hess
Columbia University, USA
- 15:45-16:15 **Award Ceremony and Closing**