

Technical Program: 1. Day – July 5

1. Day – July 5: Plenary sessions		Room 1
09:00 – 10:40		
Keynote talks		
Chair: Jaydev Desai / Georgia Inst of Technology, US		
09:00	Fibrebot: Design and fabrication Guang-Zhong Yang / Imperial College London, UK	
09:50	Micromanipulation and microrobotics for cell surgery Dong Sun / City Univ of Hong Kong, S.A.R., CN	
16:20 – 18:20		
Plenary talks		
Chair: G. K. Ananthasuresh / IIS, Bengaluru, IN		
16:20	Hybrid centralized/decentralized control of bacteria-based bio-hybrid microrobots E. J. Leaman, B. Q. Geuther, Bahareh Behkam / Virginia Tech, US	
16:50	Some examples of path following in microrobotics B. Dahroug ^a , A. Oulmas ^b , J.-A. Séon ^a , T. Xu ^b , B. Tamadazte ^a , S. Régnier ^b , Nicolas Andreff^a ^a FEMTO-ST, FR; ^b Sorbonne Université, FR	
17:20	Living cell based modular micro robot fabricated by robotic micro-manipulation system Lianqing Liu / Shenyang Inst of Automation, Chinese Acad of Sci, CN	
17:50	Arbitrary placement of AFM cantilever higher eigenmodes using structural optimization Steven Ian Moore , M. G. Ruppert, Y. K. Yong Univ of Newcastle, AU	

1. Day – July 05: Parallel technical sessions		11:00 – 13:00
Special session Room 1 Microbiorobotic systems for biomedical applications: control and animal models Organized & chaired by Hongsoo Choi Daegu-Gyeongbuk Inst of Science & Technology (DGIST), KR		
11:00	Soft microrobot to control guidewire for chronic total occlusion Hongsoo Choi / DGIST, KR	
11:20	3D pose tracking of a micro-robot using bi-planar x-ray fluoroscopy Deukhee Lee / Korea Inst of Science and Technology, KR	
11:40	Current reference projection method for securing maximum control bandwidth under voltage limit condition in magnetic manipulation system Jinsu Hong, J.-I. Ha / Seoul National Univ, KR	
12:00	Animal models of chronic total occlusion for microrobotic endovascular intervention; Chang-Hwan Yoon / Seoul National Univ Bundang Hospital, KR	
12:20	Multi-rate position estimation for micro-robot position control Su-hui Kwak, Sehoon Oh / DGIST, KR	
12:40	Tracking of medical micro-robot using convolutional neural network Sang Hyun Park / DGIST, KR	
Special session Room 2 Smart and dexterous gripping at the micro and nanoscales Organized & chaired by Redwan Dahmouche, Cedric Clevy, Michaël Gauthier / FEMTO-ST, FR		
11:00	Advanced gripping of natural and synthetic fibres at micro scale Pasi Kallio / Tampere Univ of Technology, FI	
11:20	Micro-gripping methods for micro-spheres sorting G. Fontana ^a , Giovanni Legnani ^b , S. Ruggeri ^a , I. Fassi ^a ^a Inst of Industrial Technologies and Automation, Milan, IT; ^b Univ of Brescia, IT	
11:40	Flexible untethered microgrippers: Fabrication and control for parallel pick-and-place; Eric Diller / Univ of Toronto, CA	
12:00	Design and analysis of a compound constant-force mechanism for compliant gripper X. Zhang, Qingsong Xu / Univ of Macau, S.A.R., CN	
12:20	Modeling and experimental characterization of an active MEMS based force sensor J. Cailliez ^a , Mokrane Boudaoud ^a , A. Mohand-Ousaid ^b , A. Weill-Duflos ^c , S. Haliyo ^a , S. Régnier ^a / ^a Sorbonne Univ, FR; ^b FEMTO-ST, FR; ^c McGill Univ, CA	
12:40	Smart manipulation of micro-particles using an electromagnetic needle Jean-Antoine Seon / Aalto Univ, FI	

1. Day – July 05: Parallel technical sessions		11:00 – 13:00
Special session Swimming microrobots Room 3 Organized & chaired by Samara Firebaugh United States Naval Academy, US		
11:00	What microrobots could learn from copepods Samara Firebaugh / United States Naval Academy, US	
11:20	Manipulation of non-magnetic microbeads using soft microrobotic sperm A. E. El-Etriby ^a , A. Klingner ^a , Ahmet Fatih Tabak ^b , I. S. M. Khalil ^a ^a German University in Cairo, EG; ^b Okan Univ, TR	
11:40	Physiologically responsive microbots for drug delivery and surgery David Gracias / Johns Hopkins Univ, US	
12:00	Magnetotactic bacterial microrobots for targeted killing of <i>Staphylococcus aureus</i> Changyou Chen ^{a,b} , L. Chen ^{a,b} , P. Wang ^{a,b} , L.-F. Wu ^{c,b} , T. Song ^{a,b} ^a Inst of Electrical Eng., Chinese Acad of Sci, CN; ^b France-China Int. Lab. of Evolution and Development of Magnetotactic Multicellular Organisms, Beijing, CN; ^c Aix Marseille Univ, FR	
12:20	3D micromolding of small-scale biological robots Elizabeth E. Hunter , E. W. Brink, E. B. Steager, V. Kumar Univ of Pennsylvania, US	
Special session Precision positioning I Room 4 Organized & chaired by Xianmin Zhang South China Univ of Technology, CN		
11:00	Guangdong Key Laboratory of Precision Equipment and Manufacturing Technology: Current activities Xianmin Zhang / South China Univ of Technology, CN	
11:20	Design and analysis of bistable dielectric elastomer actuator with buckling beam Nianfeng Wang , C. Cui, B. Chen, X. Zhang / South China Univ of Technology, CN	
11:40	Design optimization and analysis of a damped flexure-guided stage Zhong Chen , X. Jiang, X. Zhang / South China Univ of Technology, CN	
12:00	A high-performance moving object detection method based on optical flow Xiang Zhang , X. Zhang, K. Li / South China Univ of Technology, CN	
12:20	Evaluation of motion reliability for robot manipulator Yanjiang Huang ^a , C. Wang ^a , H. Tang ^a , Y. Shi ^b , L. Xiong ^b , L. Yang ^a , Z. He ^a , X. Zhang ^a ^a South China Univ of Technology, CN; ^b Goaltech Co., Ltd.	

1. Day – July 05:		Parallel technical sessions	14:00 – 16:00
Special session		Atomic Force Microscopy based nano-manipulation	
Room 1		Organized & chaired by G. R. Jayanth Indian Inst of Science, Bangalore, IN	
14:00	Design of high stiffness inertial slider for in-situ TEM A. K. Panda, M S Bobji / Indian Inst of Science, Bangalore, IN		
14:20	Movable nanowire laser on silicon photonic crystal using Atomic Force Microscopy Masato Takiguchi , A. Yokoo, M. D. Birowosuto, M. Notomi NTT Basic Research Laboratories, NTT Corp, JP		
14:40	Automated tip-exchange in Atomic Force Microscopy: Applications in nano-manipulation G. R. Jayanth / Indian Inst of Science, Bangalore, IN		
15:00	Navigation and robust hybrid control of AFM tip landing inside a scanning electron microscope Mokrane Boudaoud / Sorbonne Université, FR		
15:20	Heated microcantilever arrays for scalable nanomanufacturing Hoe Joon Kim / DGIST, KR		
Special session		Small-scale robots for environmental applications	
Room 2		Organized & chaired by Salvador Pané / ETH Zurich, CH	
14:00	Self-powered bioinspired microrobots for environmental remediation Martin Pumera / Univ of Chemistry and Technology, CZ		
14:20	Photocatalytic water purification with multiple-locomotion nanomachines Salvador Pané / ETH Zurich, CH		
14:40	Multifunctional oxide micromotors for environmental remediation Diana Vilela Garcia / Inst for Bioengineering of Catalonia, SP		
15:00	Magnetically driven microdevices: From material development to applications in environmental small-scale robotics Xiangzhong Chen / ETH Zurich, CH		
15:20	Piezoelectric-based swimmers for degradation of organic pollutants Fajer Mushtaq / ETH Zurich, CH		
15:40	Multiple-wavelength photocatalytically driven micromotors Bumjin Jang / ETH Zurich, CH		

1. Day – July 05: Parallel technical sessions 14:00 – 16:00	
Regular session Room 3 Measurement and characterization I Chair: Moeto Nagai / Toyohashi Univ of Technology, JP	
14:00	Micro-dispensing of graphene oxide based capacitive tactile sensors for human pressure-pulse detection / Ka Wai Kong , J. Law, M. Chen, Z. Suo, B. Jia, V. A. L. Roy, H.-Y. Chan, W. J. Li; City Univ of Hong Kong, S.A.R., CN
14:20	Mirror-based microscopic tracking system for expansive micro-observation T.Aoyama, Sarau Takeno , M.Takeuchi, J.Nakanishi, Y.Hasegawa/Nagoya Univ, JP
14:40	Sidewall imaging of microstructures with a tilted quartz tuning fork (QTF) force sensor / Danish Hussain ^{a,b} , W. Yongbing ^b , H. Xie ^b ^a National Univ of Sci and Tech, Islamabad, PK; ^b Harbin Inst of Technology, CN
15:00	Fast and accurate thickness mapping of liquid bubbles and thin protein films Zhe Wang ^a , B. Mandrachia ^a , W.-C. Chen ^b , V.Ferraro ^c , E. Di Maio ^c , P.L. Maffettone ^c , E. Fried ^b , P. Ferraro ^a / ^a Inst of Applied Sciences and Intelligent Systems, IT; ^b Okinawa Inst of Science and Technology Graduate Univ, JP; ^c Univ of Naples, IT
15:20	Rolling and sliding of spheres inside horizontal channels Ebru Demir , S. Yesilyurt / Sabanci Univ, TR
15:40	Influence of process parameters on nano-liter deposition using superhydrophilic -superhydrophobic patterned surfaces / Bo Chang ^{a,b} , O. Kivinen ^b , Q Zhou ^b ^a Shaanxi Univ of Science and Technology, CN; ^b Aalto Univ, FI
Special session Room 4 Precision positioning II Organized & chaired by Xianmin Zhang South China Univ of Technology, CN	
14:00	Topology optimization of flexure hinges with distributed stress for flexure-based mechanisms / Min Liu ^a , J. Zhan ^a , B. Zhu ^b , X. Zhang ^b ^a East China Jiaotong Univ, CN; ^b South China Univ of Technology, CN
14:20	Topology optimization of metamaterials for energy dissipation Qi Chen ^a , X. Zhang ^a , B. Zhu ^a , H. Zhang ^a , R. Wang ^a , Y. Shi ^b , L. Xiong ^b ^a South China Univ of Technology, CN; ^b Goaltech Co., Ltd.
14:40	General kinematic modeling framework for a 3D compliant micromechanism Zhong Yang , D. O. Popa / Univ of Louisville, US
15:00	Topology optimization of compliant mechanisms using moving morphable components with flexure hinge characteristic / Rixin Wang , B. Zhu, X. Zhang, H. Zhang, Q. Chen; South China Univ of Technology, CN
15:20	Multistability analysis for the compliant four-fold Bricard loops Hongchuan Zhang , X. Zhang, B. Zhu, R. Wang, Q. Chen South China Univ of Technology, CN

1. Day – July 05: Parallel technical sessions 14:00 – 16:00	
Regular session Positioning and control Room 5 Chair: Jong-Oh Park / Chonnam National Univ, KR	
14:00	Magnetic guidewire control without tip-angle detection in sharply curved blood vessel Jayoung Kim ^a , B. Kang ^a , P. B. Nguyen ^b , E. Choi ^b , C.-S. Kim ^b , J.-O. Park ^b ^a Medical Microrobot Center, Gwangju, KR; ^b Chonnam National Univ, KR
14:20	Motion control of the piezoelectric tube scanner for Lissajous trajectories with modified repetitive control Linlin Li , G. Gu, L.-M. Zhu / Shanghai Jiao Tong Univ, CN
14:40	Passive steering of miniature walking robot using the non-uniformity of robot structure J. Qu, C. B. Teeple, B. Zhang, Kenn R. Oldham / Univ of Michigan, US
15:00	Dynamic modelling and control of a sphere-based micro robot with adjustable arm A. Esfandbod, Hossein Nejat Pishkenari , A. Meghdari Sharif Univ of Technology, IR
15:20	Virtual feedback assistance system for remote operation of a 3DOF micromanipulator in micro-nanorobotic manipulation Ujjal Dey , S. Sen, M. Wan, C. Jacob, C.S Kumar Indian Inst of Technology Kharagpur, IN
15:40	Recent development in parasitic motion principle (PMP) piezoelectric positioning stages Hu Huang / Jilin Univ, CN

Technical Program: 2. Day – July 6

2. Day – July 6: Plenary sessions		Room 1
<p>Keynote talks</p> <p>09:00 – 10:40 Chair: Dong Sun / City Univ of Hong Kong, S.A.R., CN</p>		
09:00	Miniature-to-meso-scale robotic systems for therapy Jaydev Desai / Georgia Inst of Technology, US	
09:50	Amoeba-type cell-sized molecular robot Shin-ichiro M. Nomura / Tohoku Univ, JP	
<p>Plenary talks</p> <p>16:20 – 18:20 Chair: Bahareh Behkam / Virginia Tech, US</p>		
16:20	Macro-micro linkage in cardiac mechanics Gentaro Iribe / Okayama Univ, JP	
16:50	Design and kinematics of a compliant Stewart micromanipulator S. K. Mishra, C. S. Kumar Indian Inst of Technology Kharagpur, IN	
17:20	Mechanical bistable structures for microrobotics and mesorobotics: From microfabrication to additive manufacturing Yassine Haddab ^a , G. Aichea ^a , H. Hussein ^a , M. Ben Salema ^a , P. Lutz ^b , L. Rubbert ^c , P. Renaud ^c ^a Univ Montpellier, FR; ^b FEMTO-ST, FR; ^c Univ Strasbourg, FR	
17:50	Programmable molecular/nanoscale building blocks and development strategies for real-time <i>in vivo</i> Molecular/Nano Sensing Platform Jin-Woo Kim / Univ of Arkansas, US	

2. Day – July 06: Parallel technical sessions		11:00 – 13:00
Special session Room 1 Microbiorobotic systems for biomedical applications: Fabrication and delivery Organized & chaired by Hongsoo Choi Daegu-Gyeongbuk Inst of Science & Technology (DGIST), KR		
11:00	Development of remote controlled medical micro-robot for cell delivery Hongsoo Choi / DGIST, KR	
11:20	Magnetic nanoswimmers for bioorthogonal catalysis-driven targeted cancer therapy Salvador Pané / ETH, Zurich, CH	
11:40	Ceramic micro-robot from two-photon lithography of pre-ceramic polymer and movement control by external magnetic fields Dong-Pyo Kim / Pohang Univ of Sci and Tech (POSTECH), KR	
12:00	Bio-templated magnetic microrobots for directed delivery Li Zhang / Chinese Univ of Hong Kong, S.A.R., CN	
12:20	Targeted and actively controlled- drug release by using magnetically actuated microrobots Jin-young Kim / DGIST, KR	
Special session Room 2 Self-Assembly Organized & chaired by Quan Zhou / Aalto Univ, FI; Massimo Mastrangeli / TU Delft, NL		
11:00	Self-assembly by curving, bending and folding David Gracias / Johns Hopkins Univ, US	
11:20	Capillary self-assembly based multichip-to-wafer system integration technologies Takafumi Fukushima / Tohoku Univ, JP	
11:40	Micro assembly printer Eugene Chow / PARC, US	
12:00	Laser-driven droplet self-coalescence on superhydrophobic surfaces Zoran Cenev / Aalto Univ, FI	
12:20	Self-assembly: Insights from the macroscale Massimo Mastrangeli / TU Delft, NL	

2. Day – July 06:		Parallel technical sessions	11:00 – 13:00
Special session		Micro-nano sensors for robotics	
Room 3		Organized & chaired by Tie Li Inst. of Microsystem & Inform Tech (SIMIT), Chinese Acad of Sci, CN	
11:00	Millimeter wave image sensors for security robotics Xiaowei Sun / SIMIT, CAS, CN		
11:20	Reduced graphene oxide based nano-heterojunctions for high-performance room temperature gas sensors Xiaogan Li / Dalian Univ of Technology, CN		
11:40	Inclination effects on voltage-controlled tuning of MEMS disk resonator array-composite fabricated by DRIE process Linxi Dong / Hangzhou Dianzi Univ, CN		
12:00	CMOS-compatible free-standing silicon nanowire array for ultraselective detection in gas and liquid phase Anran Gao / SIMIT, CAS, CN		
12:20	Copper micro holes array for water/oil separation Zhishan Yuan / Guangdong Univ of Technology, CN		
Special session		Microwave microscopy and nanocharacterization	
Room 4		Organized & chaired by Olaf C. Haenssler / Univ Oldenburg, DE; Yang Ju / Nagoya Univ, JP	
11:00	Quantitative error analysis in Near-Field Scanning Microwave Microscopy Kamel Haddadi , P. Polovodov, D. Théron, G. Dambrine Univ Lille, FR		
11:20	Through-membrane Microwave Microscopy in liquids and Microwave Microscopy of ferroelectric thin films Alexander Tselev / CICECO, Univ of Aveiro, PT		
11:40	Integration of SMM in SEM: Studies by a new multimodal imaging and sensing technology Olaf C. Haenssler / Univ Oldenburg, DE		
12:00	Evaluation the degeneration of articular cartilage by using pulse-echo ultrasound Bing-Feng Ju / Zhejiang Univ, CN		
12:20	Conductivity measurement of metallic nanowires by Microwave Atomic Force Microscopy Yang Ju / Nagoya Univ, JP		

2. Day – July 06: Parallel technical sessions 14:00 – 16:00	
Special session Manipulation of micro-nano materials	
Room 1 Organized & chaired by Xinyu Liu and Yu Sun / Univ of Toronto, CA	
14:00	Nanorobotic probing of single GaN nanowires Xinyu Liu / Univ of Toronto, CA
14:20	Synthesis and surface-enhanced Raman scattering properties of Au@Ag core-shell nanoellipsoids Yanting Liu , Y. Shen / City University of Hong Kong, S.A.R., CN
14:40	Locomotion of microstructures driven by algae cells X. Wang ^{a,b} , Niandong Jiao ^a , S. Tung ^{a,c} , L. Liu ^a ^a Shenyang Inst of Automation, Chinese Acad of Sci, CN; ^b Univ of Chinese Acad of Sci, Beijing, CN; ^c Univ of Arkansas, US
15:00	Micromanipulation at air-liquid interface using a magnetically actuated star-shaped microrobot Lefeng Wang / Harbin Inst of Technology, CN
15:20	Pt/Au hybrid self-actuating micronanorobot towards drug delivery system Zhan Yang / Soochow Univ, CN
Special session Magnetic actuation	
Room 2 Organized & chaired by Julien Leclerc / Univ of Houston, US	
14:00	Review of electromagnets technologies for robotic magnetic manipulation Julien Leclerc , A. Becker / Univ of Houston, US
14:20	Characterization of patterned flexible permanent magnet composites for microrobotics Tianqi Xu , E. Diller / Univ of Toronto, CA
14:40	Multi-functional untethered magnetic robots with the capability of effective locomotion, unclogging motion and drug and stent deliveries in tubular environments Gunhee Jang / Hanyang Univ, KR
15:00	Control of head-tilting angle of the diamagnetically levitated microrobot in liquid media / Ali Anil Demircali ^a , C. A. Yilmaz ^b , H. Uvet ^a ^a Yildiz Technical Univ, TR; ^b SEV American College, TR
15:20	Rotating magnetic robots for blood clot removal Julien Leclerc / Univ of Houston, US

2. Day – July 06: Parallel technical sessions 14:00 – 16:00	
Regular session Micro/Nano robots I	
Room 3 Chair: Yajing Shen / City Univ of Hong Kong, S.A.R., CN	
14:00	Novel biopsy capsule endoscope for wireless intestinal tissue collection Viet Ha Le , M. C. Hoang, V. D. Nguyen, E. Choi, J.-O. Park, C.-S. Kim, J. Kim, B. Kang Chonnam National Univ, KR
14:20	Miniature robot with actuators based on Cu-Al-Ni shape memory single crystals S.A. Pulnev ^a , A.V. Chikiryaka ^a , V.I. Nikolaev ^a , A.I. Priadko ^b / ^a Ioffe Inst, RU; ^b Russian State Scientific Center for Robotics and Technical Cybernetics, RU
14:40	Bidirectional thin-film repulsive-/attractive-force electrostatic actuators for a crawling milli-robot / Ethan W. Schaler ^a , L. Jiang ^a , C. Lee ^b , R. S. Fearing ^a ^a Univ of California, Berkeley, US; ^b El Camino College, US
15:00	Flexure-based 2-DOF microgripper for handling micro-objects Tilok Kumar Das , B. Shirinzadeh, M. Ghafarian, J. Pinskiier / Monash Univ, AU
15:20	Chemically self-propelled 3D-printed microbots / Dengfeng Li ^a , Y. Liu ^a , Y. Yang ^a , Y. Shen ^{a,b} / ^a City Univ of HK, S.A.R., CN; ^b City Univ of HK Shenzhen Res. Inst, CN
15:40	Autonomous robotic vehicle for oil spills cleaning with nano particles Mohanish Shah ^a , Sakshi kokil Shah ^b , Mitesh Shah ^c ^a Symbiosis Skills and Open Univ, IN; ^b TSSM's Bhivarabai Sawant College of Eng. & Research, IN; ^c Tata Consultancy Services, Pune, IN
Regular session Design and fabrication I	
Room 4 Chair: Yoko Yamanishi / Kyushu Univ, JP	
14:00	Design of an optimized self-sensing piezoelectric cantilever for micro-robotic applications / Louis Masson , L. Xinchang, Y. Perriard; EPFL, CH
14:20	Bioinspired ionic soft actuator based on core-shell-structured bacterial cellulose membrane / Fan Wang , M. Nan, S. Cho, C.-S. Kim, J.-O. Park, E. Choi Chonnam National Univ, KR
14:40	Non-UV patterning of gelatin methacryloyl hydrogel by optically induced electropolymerization / Y. Zhang ^{a,b} , H. Yu ^a , P. Li ^{a,b} , W. Yang ^a , Junhui Law ^c , L. Liu ^a , G.-B. Lee ^d , W. J. Li ^{a,c} / ^a Shenyang Inst of Autom., CAS, CN; ^b Univ of CAS, Beijing, CN; ^c City Univ of Hong Kong, S.A.R., CN; ^d National Tsing Hua Univ, TW
15:00	Simultaneous nanoparticle synthesis and metallization using plasma and micro bubbles / Keita Ichikawa , Y. Yamashita, Y. Fukuyama, R. Masuda, Y. Yamanishi Kyushu Univ, JP
15:20	Vibration energy harvesting from multi-directional motion sources Thijs W.A. Blad ^a , D. Farhadi Macheqposhti ^a , J.L. Herder ^a , A.S. Holmes ^b , N. Tolou ^a ^a Delft Univ of Technology, NL; ^b Imperial College London, UK

2. Day – July 06: Parallel technical sessions 14:00 – 16:00	
Regular session Automation	
Room 5 Chair: Tadayoshi Aoyama / Nagoya Univ, JP	
14:00	Automated SEM-guided AFM scan with dynamically varied scan speed Jun Chen^a , J. Ge ^a , B. K. Chen ^a , Z. Gong ^a , C. Zhou ^a , C. Shi ^b , C. Ru ^c , H. Pu ^d , Y. Peng ^d , S. Xie ^d , Y. Sun ^a ^a Univ of Toronto, CA; ^b Tianjin Univ, CN; ^c Soochow Univ, CN; ^d Shanghai Univ, CN
14:20	Accurate 3D-positioning in a SEM through robot calibration Valérian Guelpa , A. V. Kudryavtsev, N. Le-Fort Piat, S. Dembélé FEMTO-ST, FR
14:40	Feedback-controlled dielectrophoretic micromanipulation J. Zemánek, Tomáš Michálek , M. Gurtner, Z. Hurák Czech Technical Univ, Prague, CZ
15:00	Vacuum-driven micropump with support columns: Toward large scale single-cell RNA-sequencing Kento Hisa , M. Kakugawa, T. Shibata, M. Nagai Toyohashi Univ of Technology, JP
15:20	Cell tracking with deep learning and the Viterbi algorithm David E. Hernandez , S. W. Chen, E. E. Hunter, E. B. Steager, V. Kumar Univ of Pennsylvania, US
15:40	Implementation scheme of orbital refueling using microsatellite Yuan-dong Li , N.-N. Wang / Northwestern Polytechnical Univ, CN

Technical Program: 3. Day – July 7

3. Day – July 7: Plenary sessions		Room 1
08:50 – 09:40	Keynote talk	
09:40 – 10:40	Plenary talks Chair: Lianqing Liu / Shenyang Inst of Autom, CAS, CN	
08:50	Tools and techniques for mechano-diagnostics G. K. Ananthasuresh / Indian Institute of Science, Bengaluru, IN	
09:40	Advanced <i>in-situ</i> TEM enabled by nanorobotic manipulation Lixin Dong / Michigan State Univ, US	
10:10	Three dimensional microfabrication using local electrophoretic deposition assisted with laser trapping controlled by a spatial light modulator Futoshi Iwata, T. Matsuura / Shizuoka Univ, JP	
Plenary talks		
16:20 – 17:20	Chair: Jin-Woo Kim / Univ of Arkansas, US	
16:20	High throughput Scanning Probe Microscope for nanometrology applications Hamed Sadeghian / Eindhoven Univ of Technology, NL	
16:50	Cell culture on biodegradable microstructures using on-chip fabrication of photocrosslinkable hydrogel Masaru Takeuchi ^a , T. Kozuka ^b , E. Kim ^b , A. Ichikawa ^b , T. Fukuda ^b , Y. Hasegawa ^a / ^a Nagoya Univ, JP; ^b Meijo Univ, Nagoya, JP	

3. Day – July 07:		Parallel technical sessions	11:00 – 13:00
Special session		Micro/Nano robotics	
Room 1		Organized & chaired by Yajing Shen / City Univ of Hong Kong, S.A.R., CN Zhan Yang / Soochow Univ, CN	
11:00	Two-dimensional layered black phosphorus for infrared photodetectors & imagers Jinshui Miao ^{a,c} , B. Song ^b , L. Dong ^a , C. Wang ^{a,d} / ^a Michigan State Univ, US; ^b Inst of Int. Machines, CAS, CN; ^c Univ of Pennsylvania, US; ^d Washington Univ, St. Louis, US		
11:20	Nano manipulation robotics via SEM / Zhan Yang ; Soochow Univ, CN		
11:40	Lab-on-a-Chip platforms for plant single-cell analysis Chengzhi Hu / Southern University of Science and Technology, CN		
12:00	Generating large-scale perfusable vascular networks inside microfluidic devices for biomedical applications Tao Yue / Shanghai Univ, CN; Univ of California, Irvine, US		
12:20	Assembly of cellular microstructures into lobule-like 3D microtissues based on microrobotic manipulation / J. Cui, Huaping Wang , Q. Shi, J. Li, Z. Zheng, T. Sun, Q. Huang, T. Fukuda / Beijing Inst of Technology, CN		
12:40	Nanomanipulating and nanowelding with an enhanced near-field effects induced by combining laser and AFM probe / Lijun Yang ; Harbin Inst of Technology, CN		
Special session		Capillary and fluidic microrobotics: Optocapillarity	
Room 2		Organized & chaired by Pierre Lambert / Univ libre de Bruxelles, BE Massimo Mastrangeli / TU Delft, NL	
11:00	Contactless optofluidics macro motors Daniele E. Lucchetta / Univ Politecnica delle Marche, IT		
11:20	Capillary dipoles: Towards thermocapillary micromanipulation of multiple particles floating at the free surface R. Terrazas ^a , A. De Maeijer ^a , A. Bolopion ^b , M. Gauthier ^b , M. Kinnaert ^a , Pierre Lambert ^a / ^a Univ libre de Bruxelles, BE; ^b FEMTO-ST, FR		
11:40	Optothermally actuated bubble microrobots for single-cell manipulation Aaron Ohta / PARC, US		
12:00	Design of adaptive micromixer based on solutocapillary Marangoni effect in a continuous-flow microreactor Dmitry Bratsun / Perm National Research Polytechnic Univ, RU		
12:20	Surface tension for micro-gripper pneumatic actuation Antoine Barbot , M. Power, F. Seichepine, G.-Z. Yang / Imperial College London, UK		

3. Day – July 07: Parallel technical sessions 11:00 – 13:00	
Regular session Measurement and characterization II Room 3 Chair: Kaoru Uesugi / Osaka Univ, JP	
11:00	Study on micro flow sensor using diamagnetic levitations Gizem Aydemir , B. Calis, H. Uvet, K. Erkan Yıldız Technical Univ, TR; Uskudar American Academy, TR
11:20	Force sensor clamp for tensile characterization of ultra-thin membrane Shinya Sakuma , Y. Gao, Y. Murozaki, F. Arai / Nagoya Univ, JP
11:40	Improving acquisition time in Scanning Microwave Microscopy by undersampling the scan area / M. F. Wiegand ^a , Olaf C. Haenssler ^{a,b} , S. Fatikow ^a ^a Univ of Oldenburg, DE; ^b University of Lille, FR
12:00	Air-liquid interface as a novel tool for mechanodiagnostics R.S. Kotesa , G.K. Ananthasuresh, P. Sen / Indian Inst of Science, Bangalore, IN
12:20	Developing innovative measuring methodologies to understand nanoscale adhesion and friction / Han Huang ^a , S. Wang ^a , H. Xie ^a , A. Roy ^a , J. Mead ^a , B. Yu ^a , S. Zimmermann ^b , S. Fatikow ^b / ^a Univ of Queensland, AU; ^b Univ of Oldenburg, DE
12:20	Development of a novel monitoring technique for micro-living components utilizing heat diffusion and its application on cultured cells Takashi Katayama , Y. Takashima, S. Katayama, K. Uesugi, K. Morishima ^a Osaka Univ, JP; ^b Futatsunomiyako, JP
Special session Research on space applications at small scale Room 4 Organized & chaired by Huiquan Wang / Zhejiang Univ, CN	
11:00	Image processing based on FPGA+DSP Huiquan Wang / Zhejiang Univ, CN
11:20	Miniaturized precision inter-satellite ranging system and its application to enhanced relative navigation for satellite formations Xiaojun Jin / Zhejiang Univ, CN
11:40	Reproduction in space Dan Zhang / Zhejiang Univ, CN
12:00	Gecko-inspired adhesion technology for space engineering Zhendong Dai / Nanjing Univ of Aeronautics and Astronautics, CN
12:20	Tele-robots in extreme environments Hongyi Li / Shenyang Inst of Automation, Chinese Acad of Sciences, CN

3. Day – July 07: Parallel technical sessions		11:00 – 13:00
Regular session		Manipulation
Room 5		Chair: Sinan Haliyo / Sorbonne Univ, FR
11:00	The application of optically-induced AC electrokinetic mechanism in a microfluidic system for the size-based separation of magnetic microbeads Po-Yu Chu ^a , J.-L. Hong ^b , M.-H. Wu ^a ^a Chang Gung Univ, TW; ^b National Taiwan Univ, TW	
11:20	Isolating single motile cell using high-speed micropipette Yusuke Kasai , S. Sakuma, F. Arai / Nagoya Univ, JP	
11:40	Handheld master device for 3D remote micro-manipulation S. Sakr, T. Daunizeau, D. Reversat, S. Régnier, Sinan Haliyo / Sorbonne Univ, FR	
12:00	Vibrational analysis during cell injection in ICSI operation Ferhat Sadak , M. Saadat, A. M. Hajiyavand, G. Nomicos / Univ of Birmingham, UK	
12:20	Whole blood cell separation on clogging-free microfluidic device Anas Mohd Noor ^a , T. Masuda ^a , W. Lei ^b , K. Horio ^a , T. I. Saito ^c , Y. Miyata ^c , F. Arai ^a ^a Nagoya Univ, JP; ^b Beijing Inst of Technology, CN; ^c Nagoya Medical Center, JP	
12:40	MagMan: Testbed for distributed magnetic manipulation Jiří Zemánek , Z. Hurák / Czech Technical Univ, Prague, CZ	
3. Day – July 07: Parallel technical sessions		14:00 – 16:00
Special session		Light-driven microrobots
Room 3		Organized & chaired by Stefano Palagi and Tian Qiu / Max Planck Inst for Int. Systems, DE
14:00	Optically driven microrobots by liquid crystalline elastomers Daniele Martella / University of Florence, IT	
14:20	Self-regulating light driven soft robotics Hao Zeng / Tampere Univ of Technology, FI	
14:40	Microgels that swim on the beat of light Ahmed Mourran / DWI - Leibniz-Inst for Interactive Materials, Aachen, DE	
15:00	Cooperative micromanipulation using optothermocapillary bubble microrobots Aaron Ohta / Univ of Hawaii, US	
15:20	Soft microrobots controlled by light field Tian Qiu / Max Planck Inst for Int. Systems, DE	

3. Day – July 07:		Parallel technical sessions	14:00 – 16:00
Special session		Microsystems for analysis of single cells and small organisms	
Room 1		Organized & chaired by Yu Sun and Xinyu Liu / Univ of Toronto, CA	
14:00	On-chip robotics for analysis of single cells and small organisms Fumihito Arai / Nagoya Univ, JP		
14:20	Microsystems for biophysical characterization of human cardiomyocytes Yu Sun / Univ of Toronto, CA		
14:40	Cell encapsulation for targeted delivery using a microrobot Hongsoo Choi / Daegu Gyeongbuk Inst of Sci & Tech (DGIST), KR		
15:00	SMC difference of normal and cancerous human urothelial cells quantified with an opto-electrokinetic device / Yanbin Lin ^a , N. Liu ^a , Y. Yang ^a , S. Xie ^a , L. Dong ^b , Y. Peng ^a , H. Pu ^a , P. Y. Chiou ^c , W. J. Li ^d , Yu Sun ^e ^a Shanghai Univ, CN; ^b Shanghai Jiao Tong Univ, CN; ^c Univ of California, Los Angeles, US; ^d City Univ of Hong Kong, S.A.R., CN; ^e Univ of Toronto, CA		
15:20	Automated robotic stimulation of freely moving <i>Drosophila</i> larvae Peng Pan ^{a,b} , J. Qu ^{a,b} , W. Zhang ^{a,b} , X. Dong ^{a,b} , X. Liu ^a ^a Univ of Toronto, CA; ^b McGill Univ, CA		
Special session		Capillary and fluidic microrobotics: Droplets and wetting	
Room 2		Organized & chaired by Pierre Lambert / Univ libre de Bruxelles, BE Massimo Mastrangeli / TU Delft, NL	
14:00	MEMS-based piezoresistive force sensors for measuring and controlling droplet dynamics Thanh-Vinh Nguyen / Univ of Tokyo, JP		
14:20	Micro droplets generation in a flowing continuous liquid using an ultrasonic transducer Nozomu Fujimoto ^a , T. Murakami ^a , K. Mori ^a , T. Yamada ^a , T. Kanda ^a , K. Suzumori ^b ^a Okayama Univ, JP; ^b Tokyo Inst of Technology, JP		
14:40	Self-cleaning solar panels Karl Boehringer / Univ of Washington, US		
15:00	Scanning droplet adhesion microscopy Quan Zhou / Aalto Univ, FI		
15:20	Multi-scale 3D printed capillary gripper M. Cavaiani ^a , S. Dehaeck ^b , Y. Vitry ^b , Pierre Lambert ^b ^a Politecnico di Milano, IT; ^b Univ libre de Bruxelles, BE		

3. Day – July 07:		Parallel technical sessions	14:00 – 16:00
Regular session		Micro/Nano robots II	
Room 4		Chair: Sinya Sakuma / Nagoya Univ, JP	
14:00	Ferrofluid levitated micro/milli-robots Allen Hsu , A. Wong-Foy, R. Pelrine / SRI International, US		
14:20	Dynamic behavior of running insect activated by high-speed microdroplets manipulation / Belal Ahmad ^a , D. Sato ^a , R. Takemoto ^a , H. Ohtsuka ^b , I. Ishii ^c , T. Kawahara ^a / ^a Kyushu Inst of Technology, JP; ^b National Inst of Technology, Kumamoto College, JP; ^c Hiroshima Univ, JP		
14:40	Tilted leg design for a rapid-prototyped low-voltage piezoelectric running robot Ketul Patel , J. Qu, K. R. Oldham / Univ of Michigan, US		
15:00	Soft hydrogel microrobot actuated using NIR and EMA integration system Hyoryong Lee , H. Choi, S. Park / DGIST, KR		
15:20	IPMC kirigami: Distributed actuation concept / A. Hunt, M. Freriks, L. Sasso, P. M. Esfahani and S. Hassan HosseinNia / Delft Univ of Technology, NL		
15:40	Controlled delivery of signaling molecules using magnetic microrobots S. Das ^a , Elizabeth E. Hunter ^a , N. A. DeLateur ^b , E. B. Steager ^a , R. Weiss ^b , V. Kumar ^a ^a Univ of Pennsylvania, US; ^b Massachusetts Inst of Technology, US		
Regular session		Design and fabrication II	
Room 5		Chair: Aakihiko Ichikawa / Mijyo Univ, JP	
14:00	Fabrication of vascular network in 3D cell-dense structure by using magn. fibers Eunhye Kim ^a , M. Takeuchi ^b , W. Atou ^a , T. Kozuka ^a , T. Nomura ^a , Y. Iwamoto ^a , A.Hasegawa ^a , A.Ichikawa ^a , T.Fukuda ^{a,c} / ^a Meijo Univ, JP; ^b Nagoya Univ, JP; ^c BIT, CN		
14:20	Design, analysis and fabrication of sAFAM, a 4 DoF assembled microrobot Ruoshi Zhang , D. Wei, D. O. Popa / Univ of Louisville, US		
14:40	Design of a novel piezoelectric stick-slip driving nanopositioning stage and power supply circuit / Sen Gu , C. Ru; Soochow Univ, CN		
15:00	Fabrication of peristaltic movement system imitating snail / Akiyuki Hasegawa ^a , J. Takeyama ^a , A. Ichikawa ^a , T. Fukuda ^{a,b} / ^a Meijo Univ, JP; ^b Beijing Inst of Tech, CN		
15:20	Composite nanotools with shape memory effect for nanostructures assembly Andrey P. Orlov , P.V. Lega, A.V. Frolov, S. Zybtev, V.Ya. Pokrovskii, V.V. Koledov Kotelnikov Inst of Radioengineering and Electronics, Russian Acad of Sci, RU		
15:40	Dielectrophoretic microfluidic device for size-based separation of microparticles: Feasibility study / A. O. M. Al-Mehairi ^a , A. Childs-Santos ^b , I. Anokam ^b , J. Buie ^b , S. Ramesh ^a , A. Hilal-Alnaqbi ^{a,c} , F. Alnaimat ^a , Bobby Mathew ^a ^a UAE Univ, AE; ^b Howard Univ, US; ^c Abu Dhabi Polytechnic, AE		