

Program at a Glance

Arrival day: October 09 (Mon)

15:00 – 16:00 Registration and NYUAD campus tour

16:00 – 18:00 Laboratory tour at NYUAD

18:00 – 20:00 Welcome reception

1. day: Oct 10 (Tue)	2. day: Oct 11 (Wed)	3. day: Oct 12 (Thu)
08:30 Opening	08:30 Plenary talks	08:30 Plenary talks
09:10 Plenary talks		
10:30 Coffee break	10:30 Coffee break	10:30 Coffee break
11:00 Parallel sessions	11:00 Parallel sessions	11:00 Parallel sessions
13:00 Lunch	13:00 Lunch	13:00 Lunch
14:00 Parallel sessions	14:00 Parallel sessions	14:00 Parallel sessions
16:00 Coffee break	16:00 Coffee break	16:00 Coffee break
16:30 Plenary talks	16:30 Plenary talks	16:30 Plenary talk
17:50 End of the 1. day	17:50 End of the 2. day	17:50 Closing/Awards
18:00 Steering Committee meeting & dinner <i>(by invitation only)</i>		19:00 MARSS banquet
		21:30 End of the 3. day

After-work day: October 13 (Fri)

Ideas for self-directed sightseeing are provided on the conference website

Technical Program: 1. Day – October 10

1. Day – October 10: Plenary sessions		Auditorium
08:30 – 09:10 Opening ceremony		
09:10 – 10:30 Plenary talks Chair: Igor Aronson / Pennsylvania State University, US		
09:10	Materials for small-scale robots Salvador Panè i Vidal / Swiss Federal Inst of Tech (ETH) Zurich, CH	
09:50	Self-propelling macro-scale sheets powered by enzymes Ayusman Sen / Pennsylvania State University, US	
16:30 – 17:50 Plenary talks Chair: Metin Sitti /Max Planck Inst for Intell Systems, DE		
16:30	How we put cells to work in microrobotics Veronika Magdanz / University of Waterloo, CA	
17:10	Bioinspired small robotics for biomedical engineering Yajing Shen / Hong Kong Univ of Science and Technology, S.A.R., CN	

1. Day – October 10:		Parallel technical sessions	11:00 – 13:00
Special session Room 004		Vision-based measurement and control in micro/nano manipulation systems Organized & chaired by Xianmin Zhang / South China University of Technology, CN	
11:00	Suppression of noise in SEM images using adaptive anisotropic partial differential equations Shuiquan Pang , S. Wu, Z. Wang, J. Luo, Q. Zhang China Electronic Product Reliability and Environmental Testing Research Inst, CN		
11:20	Rapid release of micro-objects by using compound drive vibration S. Liu, R. Wang, Lixin Yang , H. Li, X. Zhang, B. Zhu South China University of Technology, CN		
11:40	Kinematic calibration of a 3DOF compliant nanopositioning stage based on visual measurement Nuo Xu, Hai Li , X. Zhang, L. Yuan, B. Zhu / South China Univ of Technology, CN		
12:00	Depth of field extension for microscopic structured light vision system based on image fusion W. Cai, Xianmin Zhang , H. Li, Z. Liao / South China University of Technology, CN		
12:20	Bending harmonic Atomic Force Microscopy for high sensitivity mapping of microgroove topography Ke Feng , J. Lai, B. Zhu, X. Zhang / South China University of Technology, CN		
Special session Room 001A		Magnetic-based manipulation from nanometer to centimeter Organized & chaired by Zoran Cenev / Aalto University, FI	
11:00	Individual magnetic Quinke rollers in rotating magnetic field Zoran Cenev / Aalto University, FI		
11:20	Shaping liquid droplets using ferrofluidic manipulator Quan Zhou / Aalto University, FI		
11:40	Robotic magnetic tweezers for mechanical measurement Xian Wang / Queen's University, CA		
12:00	Shape-forming control for soft continuum magnetic robots Ali Hoshidar / University of Essex, UK		
12:20	Magnetic surface microrollers for endovascular navigation Ugur Bozuyuk / Max Planck Institute for Intelligent Systems, DE		
12:40	Enhancing physical interactions of untethered miniature magnetic robots for biomedical applications; Ren Hao Soon / Max Planck Inst for Intell. Systems, DE		

1. Day – October 10:		Parallel technical sessions	11:00 – 13:00
Special session		Collective behavior and emergent functionalities in microrobotic swarms (I)	
Lecture Hall		Organized by Ayusman Sen & Igor S. Aronson / Penn State Univ, US Chaired by Igor S. Aronson	
11:00	Material application of synthetic active colloidal systems Jinyao Tang , J. Zheng, C. Wu University of Hong Kong, S.A.R., CN		
11:20	Collective behaviors of active microscale oil droplets Lauren D. Zarzar / Pennsylvania State University, US		
11:40	Green energy for autonomous devices: Surfactant-enhanced membraneless hydrogen peroxide fuel cells F. Zhu ^a , A. Kuzin ^{a,b} , G. Chen ^a , D.A. Gorin ^b , B. Mohan ^c , G. Huang ^a , S. Zhao ^d , Y. Mei ^a , Alexander A. Solovev^a ^a Fudan Univ, CN; ^b Skolkovo Inst of Sci&Tech, RU; ^c ULisboa, PT; ^d Guangxi Univ, CN		
12:00	Exploiting dynamicity to induce motility: Motion of membranized coacervate motors Loai K.E.A. Abdelmohsen / Eindhoven University of Technology, NL		
12:20	Optoelectronic directed self-assembly of self-propelling electrically-powered active particles S.S. Das, Gilad Yossifon Tel-Aviv University, IL		
Special session		Micro-nano devices for smart robotics (I)	
Room 005		Organized & chaired by Tie Li / SIMIT, CAS, CN	
11:00	Surface Acoustic Wave multi-parameter micro-nano sensing technology Wen Wang / Institute of Acoustics, CAS, CN		
11:20	MXene-based heterojunction for room-temperature NH ₃ sensors: Materials design and sensing mechanisms Xiaogan Li / Dalian University of Technology, CN		
11:40	Self-powered multi-functional sensing smart microsystems Xiaosheng Zhang University of Electronic Science and Technology of China, CN		
12:00	Construction of carbon-based nanointerfaces and biosensing applications Yanzhi Dou / SIMIT, CAS, CN		
12:20	Heterogeneous integration for 5G RF filter technology Xin Ou / SIMIT, CAS, CN		

1. Day – October 10:		Parallel technical sessions	11:00 – 13:00
Regular session		Measurement and characterization (I)	
Room 001C		Chair: G.K. Ananthasuresh / Indian Inst of Science, Bangalore, IN	
11:00	Manipulation and probing of cell nucleus at the micro- and nanoscale uncovers a potential role of β -actin in nuclear biomechanics Muhammedin Deliorman , T. Gjorgjieva, X. Xie, P. Percipalle, M.A. Qasaimeh New York University Abu Dhabi, AE		
11:20	Numerical technique for mapping of elastic properties of live biological cells using non-destructive aspiration; S. Jaddivada, S.R. Raju, G.K. Ananthasuresh Indian Institute of Science, Bangalore, IN		
11:40	Integrating live-cell imaging with magnetic manipulation system Paramita Modak , R.V. Ramachandran, N. Ahmed, R. Bhat, D.K. Saini, A. Ghosh Indian Institute of Science, Bangalore, IN		
12:00	Design and fabrication of a compliant micromechanism amenable for biaxial stretching of single cells; H. Marwah, R. Nautiyal, N. Fartyal, Sreenath Balakrishnan / Indian Institute of Technology, Goa, IN		
12:20	Bulk stiffness measurement of mouse embryos using microcantilever and image segmentation; Patil Kunal Dushyantrao ^a , Madhumitha S ^b , S. Hegde ^a , K. Bharadwaj K.S. ^a , A. Karupakula ^a , R. Babu T.J. ^a , S. Bhargava ^a ^a Spovum Technologies Pvt Ltd, Bangalore, IN; ^b Indian Inst of Sci, Bangalore, IN		
Regular session		Design and fabrication	
Room 006		Chair: Rodica C. Voicu / National Inst for R&D in Microtechn, RO	
11:00	Leaf-spring-type suspension device for compact electromagnetic vibrators Yu Gao , W. He / Zhejiang University, CN		
11:20	Study of two microgrippers with integrated piezoresistive force/displacement sensors; Rodica Cristina Voicu ^a , C. Tibeica ^a , M. Pustan ^b , C. Birleanu ^b ^a National Inst for R&D in Microtechnologies, RO; ^b Tech University of Cluj-Napo, RO		
11:40	FluidTIP for high-resolution imaging and enhanced micro- and nano-scale biomanipulations in atomic force microscopy Ayoub Glia , M. Deliorman, M.A. Qasaimeh / New York University Abu Dhabi, AE		
12:00	Topology optimization of piezoelectric structures : Micro-actuators and energy harvesters; Abbas Homayouni-Amlashi ^a , T. Schlinquer ^b , P. Kipkemoi ^{a,c} , J.B. Byiringiro ^c , M. Rakotondrabe ^d , M. Gauthier ^a , A. Mohand-Ousaid ^a ^a FEMTO-ST, FR; ^b ESEO, FR; ^c Dedan Kimathi Univ of Tech, KE; ^d Univ of Toulouse, FR		
12:20	Non-contact microfluidic mixing probe for generating controlled concentration gradient; Dima S. Ali , A. Glia, P. Sukumar, M. Deliorman, M.A. Qasaimeh New York University Abu Dhabi, AE		

1. Day – October 10: Parallel technical sessions 14:00 – 16:00	
Special session Lecture Hall	Biomimetic materials & advanced controlled systems in Small Robotics Organized & chaired by Maria Guix Noguera / University of Barcelona, ES Hongsoo Choi / Daegu-Gyeongbuk Inst of Sci and Tech (DGIST), KR
14:00	Multi-functional interlocked microrobotic superstructures Fabian Landers / ETH Zurich, CH
14:20	Thrombi-on-a-chip by spatio-temporal diffusion control Ramón Santiago Herrera Restrepo University of Barcelona, ES
14:40	Integration of ferrofluid into 3D bioprinted skeletal muscle-based actuators provides magnetic guidance and improves force contraction Judith Fuentes Institute for Bioengineering of Catalonia, ES
15:00	Microrobotic embryo transport: From in vitro to in vivo Mariana Medina Sánchez / IFW Dresden, DE
15:20	Magnetic micro- & nanobots and their visualization with magnetic particle imaging Anna C. Bakenecker / Fraunhofer IMTE, DE
15:40	Ultrasound-responsive materials in microrobotics Amirreza Aghakhani / University of Stuttgart, DE
Special session Room 004	Research on space applications at small scale Organized & chaired by Huiquan Wang / Zhejiang University, CN
14:00	Study on high speed GaAs based PIN monolithic switch Hao Sun / SIMIT, CAS, CN
14:20	Study of MEMS 3-axis force sensor integrated with self-calibration function M. Hua ^a , Y. Xing ^a , T. Yu ^a , Y. Zhong ^a , J. Zhao ^a , W. You ^b , G. Wu ^b , C. Liu ^a , Linxi Dong^a ^a Hangzhou Dianzi University, CN; ^b Wuhan University, CN
14:40	Depth information extraction methods for micro-manipulation in ICSI Yongxing Zhang / Zhejiang University, CN
15:00	<i>C. elegans</i> as an animal model for studying the neuronal function Wei Yang / Zhejiang University, CN
15:20	Space application of microfluidic technology Huiquan Wang / Zhejiang University, CN

1. Day – October 10: Parallel technical sessions		14:00 – 16:00
Special session Acoustic manipulation, visualization and actuation of microrobots and microparticles Room 001A Organized & chaired by Paul Wrede / Max Planck Inst for Intelligent Syst, Stuttgart, DE		
14:00	Active colloids spinning by localized acoustic microstreaming Ruitong Zhu / Harbin Institute of Technology Shenzhen, CN	
14:20	Torsional microactuators powered by ultrasound Amit Dolev / EPFL, CH	
14:40	Focused ultrasound enabled microparticle manipulation Paul Wrede / Max Planck Inst for Intelligent Syst, Stuttgart, DE	
15:00	Comparing US-based imaging methods in microrobot tracking tasks Veronica Iacovacci / Scuola Superiore Sant'Anna Pisa, IT	
15:20	Engineering microrobots to report biomarker activity via ultrasound Simone Schürle / ETH Zürich, CH	
15:40	Ultrasound microrobots for medicine Daniel Ahmed / ETH Zürich, CH	
Regular session Micro/Nano robots (I) Room 001C Chair: Ambarish Ghosh / Indian Institute of Science, Bangalore, IN		
14:00	Correlating the dynamics of magnetic nanobots with the intracellular topography Souravi Mukherjee, N. Ahmed, R.V. Ramachandran, R. Bhat, D.K. Saini, A. Ghosh Indian Institute of Science, Bangalore, IN	
14:20	Human-scale permanent magnetic actuation system for wireless millirobots Moonkwang Jeong^a, M. Zhang^a, F. Fischer^b, T. Qiu^b ^a University of Stuttgart, DE; ^b German Cancer Research Center, Dresden, DE	
14:40	Simplified model for the secular dynamics of a parametrically-excited magnetic micro-particle Aditya Shukla, G.R. Jayanth, A.K. Mohanty / Indian Inst of Science, Bangalore, IN	
15:00	Untethered magnetic miniature robots that selectively target bacterial colonies in a biomimetic infection model H. He, H.C. Fuller, Warren C. Ruder / University of Pittsburgh, US	
15:20	Magnetic bent microrods show intermittent direction reversal under rotating magnetic field; Paramita Modak, G.Patil, A.Ghosh/Indian Inst of Sci, Bangalore, IN	
15:40	Complementary clamp-based multi-degree-of-freedom parallel inchworm actuator X. Zhang, Peng Yan / Shandong University, CN	

1. Day – October 10: Parallel technical sessions 14:00 – 16:00	
Regular session	Positioning and control (I)
Room 005	Chair: Richard Nauber / Leibniz Inst for Solid State & Mater Res, DE
14:00	<p>Robotic flexure-stage-based Printed Circuit Board inchworm neural microdrives</p> <p>Mladen Barbic, J. Espinoza, H. Garcia Estrada, D. Hamilton NYU Langone Health’s Institute for Health Technology and Engineering, US</p>
14:20	<p>Towards micro nanorobotic platform for single virusonics</p> <p>Svetlana V. von Gratowski^a, V.V. Koledov^a, S. Balashov^b ^aKotelnikov Inst of Radioengineering and Electronics, RAS, RU; ^bRenato Archer Information Technology Center, BR</p>
14:40	<p>Actuation of ferrobots in a plane for independent and swarm motion using a grid of electromagnets</p> <p>Sudhanva Bhat, G K Ananthasuresh / Indian Institute of Science, Bangalore, IN</p>
15:00	<p>Photoacoustics-guided real-time closed-loop control of magnetic microrobots</p> <p>Richard Nauber, M. Medina-Sánchez Leibniz Institute for Solid State and Materials Research - IFW, DE</p>
15:20	<p>Modular platform for magnetic minirobots operation with integrated non-visual localization</p> <p>Martin Vitek, J. Šedivec, M. Juřík, J. Kuthan, F. Mach University of West Bohemia, CZ</p>
15:40	<p>An intuitive approach to microrobot manipulation with simulated immersive Virtual Reality (VR)</p> <p>A.M.M.B. Chowdhury, S.A. Abbasi, N.L. Gharamaleki, J.-y. Kim, H. Choi Daegu-Gyeongbuk Inst of Sci and Tech (DGIST), KR</p>

Technical Program: 2. Day – October 11

2. Day – October 11: Plenary sessions Auditorium	
08:30 – 10:30 Plenary talks Chair: Alexander Solovev / Fudan University, CN	
08:30	Engineering biocompatible swarms of enzyme-powered nanomotors for in vivo applications Samuel Sánchez Ordóñez / Institute for Bioengineering of Catalonia, Catalan Inst for Research and Advanced Studies
09:10	The advance of precise in vitro, ex vivo, and in vivo cell delivery using magnetic micro/nanorobots Hongsoo Choi / Daegu Gyeongbuk Inst of Sci & Tech (DGIST), KR
09:50	On the control of smart micro/nano positioning systems with high nonlinearities Mohammad Al Janaideh / Univ of Guelph & Memorial Univ, CA
16:30 – 17:50 Plenary talks Chair: Simone Schuerle / ETH Zurich, CH	
16:30	Fabrication, actuation and imaging of microdrillers for neurosurgical applications Azadeh Ansari / Georgia Institute of Technology, US
17:10	Towards fully-electric organ-on-chip devices and platforms Massimo Mastrangeli / Delft University of Technology, NL

2. Day – October 11:		Parallel technical sessions	11:00 – 13:00
Special session		Smart microrobots for diagnostics and therapy	
Lecture Hall		Organized & chaired by Carmen C. Mayorga-Martinez / Technical University of Ostrava, CZ Mariana Medina-Sánchez / IFW Dresden, DE Martin Pumera / CEITEC, Brno, CZ	
11:00	Magnetic soft microrobots with programmable anisotropy Veronica Iacovacci / Scuola Superiore Sant'Anna Pisa, IT		
11:20	Smart micro scale robotics for pathogens and cancer cells biosensing, manipulation and therapy; Carmen C. Mayorga-Martinez / Technical University of Ostrava, CZ		
11:40	Flexible magnetic robots for applications in the urinary tract Veronika Magdanz / University of Waterloo, CA		
12:00	Team of miniaturized robots for endoscopic electrocauterization Tian Qiu / DKFZ Dresden, DE		
12:20	High speed control of single cells using dielectrophoresis: Toward advanced immunotherapies A. Lefevre, Michaël Gauthier , A. Bolopion / FEMTO-ST, FR		
12:40	Micro and nanorobots for biofilm removal Martin Pumera / CEITEC, Brno, CZ		
Special session		Manipulation using magnetic microrobots	
Room 004		Organized & chaired by Sambeeta Das / University of Delaware, US	
11:00	Closed loop control of bubble propelled microrobots Y. Yang, D. Rivas, Max Sokolich , S. Das / University of Delaware, US		
11:20	Magnetic microrobots as a platform for cell clean up F.C. Kirmizitas, D. Rivas, Sudipta Mallick , S. DePope, S. Das / Univ of Delaware, US		
11:40	Rolling helical microrobots for cell patterning Y. Yang ^a , F.C. Fatma Ceren Kirmizitas ^a , M. Sokolich ^a , A. Valencia ^a , D. Rivas ^a , M.C. Karakan ^b , A.E. White ^b , A. Malikopoulos ^a , S. Das ^a ^a University of Delaware, US; ^b Boston University, US		
12:00	Programmable modular acoustic microrobots S. Cherukumilli ^a , Fatma Ceren Kirmizitas ^a , M. Sokolich ^a , A. Valencia ^a , M.C. Karakan ^b , A.E. White ^b , A. Malikopoulos ^a , S. Das ^a ^a University of Delaware, US; ^b Boston University, US		
12:20	Closed-loop control for a heterogeneous group of magnetically-actuated microrobots; L.E. Beaver ^a , Z.H. Shah ^b , Max Sokolich ^b , A.E. Yilmaz ^a , Y. Yang ^b , C. Belta ^a , S. Das ^b / ^a Boston University, US; ^b University of Delaware, US		

2. Day – October 11: Parallel technical sessions 11:00 – 13:00	
Special session Room 001A	Collective behavior and emergent functionalities in microrobotic swarms (II) Organized by Ayusman Sen & Igor S. Aronson / Penn State Univ, US Chaired by Ayusman Sen
11:00	Chemically-powered micropropellers for cargo transport and manipulation Igor S. Aronson ^a , A.D. McGovern ^a , M.-J. Huang ^b , J. Wang ^c , R. Kapral ^b ^a Penn State Univ, US; ^b Univ of Toronto, CA; ^c Heilongjiang Univ of Sci and Tech, CN
11:20	Swarming behavior of enzymatic nanomotors: Experiments and simulations Shuqin Chen ^a , X. Peetroons ^a , A. Bakenecker ^a , I.S. Aranson ^b , S. Sánchez ^a ^a Barcelona Inst of Science and Technology, ES; ^b Penn State Univ, US
11:40	Swarming self-adhesive microgels enabled aneurysm on-demand embolization in physiological blood flow Li Zhang / Chinese Univ of Hong Kong, S.A.R., CN
12:00	Phoresis-driven catalysis and vice-versa Subhabrata Maiti / Indian Inst of Science Education and Research, Mohali, IN
12:20	Emergent functionalities of bioinspired catalytic nanorobots enabled by DNA nanotechnology Tania Patino / Eindhoven University of Technology, NL
Special session Room 005	Micro-nano devices for smart robotics (II) Organized & chaired by Tie Li / SIMIT, CAS, CN
11:00	Oligonucleotide synthesis microdevice via programmable electrochemical controlled array Jianlong Zhao , Y. Luo / SIMIT, CAS, CN
11:20	Integrated fabrication of MEMS devices on ultra-thin cylindrical substate for smart applications Zhuoqing Yang / Shanghai Jiao Tong University, CN
11:40	MEMS array tactile sensors with a self-calibration structure Yuxin Zhong ^a , M. Hu ^a , Y. Xing ^a , J. Zhao ^a , W. You ^b , G. Wu ^b , C. Liu ^a , L. Dong ^a ^a Hangzhou Dianzi University, CN; ^b Wuhan University, CN
12:00	Bio-inspired flexible tactile and proximity sensors for robotic manipulation Yonggang Jiang / Beihang University, CN
12:20	Integrated IR CO ₂ gas sensor Tie Li , Y. Wang / SIMIT, CAS, CN

2. Day – October 11:		Parallel technical sessions	11:00 – 13:00
Regular session		Measurement and characterization (II)	
Room 001C		Chair: Quan Zhou / Aalto University, FI	
11:00	Droplet probe for characterization of advancing and receding contact angles of single fibers Arthur Vieira , M. Vuckovac, I. Schlapp-Hackl, M. Hummel, Q. Zhou / Aalto Univ, FI		
11:20	Free-ended linear model for a wireless mechano-sensing probe to determine viscoelastic properties; Felix Fischer ^a , M. Jeong ^b , T. Qiu ^a ^a German Cancer Research Center, Dresden, DE; ^b University of Stuttgart, DE		
11:40	Adhesive force sensing via the optical microscope readout of nanowire cantilevers James. L. Mead ^a , S. Wang ^b , L. Ma ^a , H. Huang ^c , S. Faitkow ^a ^a Univ of Oldenburg, DE; ^b Central South Univ, CN; ^c Univ of Queensland, AU		
12:00	Robotic-based selection, manipulation and characterization of 3D microscale particles with complex structures in SEM; R. Hannouch, G. Colas, J.-Y. Rauch, V. Reynaud, J. Agnus, O. Lehmann, F. Marionnet, Cédric Clévy / FEMTO-ST, FR		
12:20	Integration of optical manipulation, microfluidic and deep learning for experimental mechanobiology Nicolas Inacio , E. Gerena, F. Sadak, S. Haliyo / Sorbonne University, FR		

2. Day – October 11: Parallel technical sessions		14:00 – 16:00
Special session		Biomimetic and biohybrid actuators
Lecture Hall		Organized & chaired by Takeshi Hayakawa / Chuo University, JP Masaru Takeuchi / Nagoya University, JP
14:00	Light-driven hydrogel actuators and its deformation control by using mechanical constraint; K. Nakano ^a , Y. Yokoyama ^b , Takeshi Hayakawa ^a ^a Chuo University, JP; ^b Toyama Industrial Technology R&D Center, JP	
14:20	Driving of flagellated micro-gel robot and flow observation Hinako Sato ^a , Y. Yokoyama ^b , T. Hayakawa ^a ^a Chuo University, JP; ^b Toyama Industrial Technology R&D Center, JP	
14:40	Evaluation of adhesion forces of a molecular recognition for assembly/disassembly of a modular microrobot T. Wada ^a , N. Watanabe ^a , Y. Yokoyama ^b , Takeshi Hayakawa ^a ^a Chuo University, JP; ^b Toyama Industrial Technology R&D Center, JP	
15:00	Reconstruction of gait motion synchronized with voluntary movement using a 4-channel neurostimulator; Masaru Takeuchi , N. Ito, K. Tokutake, T. Aoyama, S. Kurimoto, H. Hirata, Y. Hasegawa / Nagoya University, JP	
15:20	Real-time monitoring system for C2C12 bio-actuator contraction Xuankai Gao , M. Takeuchi, E. Kim, T. Fukuda, Y. Hasegawa / Nagoya University, JP	
Special session		Compliant mechanism-based devices for micro/nano robotics
Room 004		Organized & chaired by Xianmin Zhang / South China University of Technology, CN
14:00	Design and analysis of a compact tensioning device for a cable drive manipulator Y. Lu, X. Zhang, Y. Chen, Y. Wu, Yanjiang Huang South China University of Technology, CN	
14:20	Design of a 2-DOF XZ precision positioning platform using novel Z-shaped flexure hinges W. Xie, Jinqiang Gan / China Univ of Geosciences, CN	
14:40	Novel compliant rotation reduction mechanism and its application in micro-rotation manipulation Weilin Chen , Y. Xu, Q. Lu, Q. Zhang, H. Wie, Z. Lin / Foshan University, CN	
15:00	Design of a microforce sensing gripper for micro/nano manipulation based on optical fiber sensing Haoyan Zang , X. Zhang / South China University of Technology, CN	
15:20	Design of a 5-axis macro-micro series-parallel hybrid robot positioning system Nianfeng Wang , G. Shang, X. Zhang / South China University of Technology, CN	

2. Day – October 11: Parallel technical sessions		14:00 – 16:00
Special session Advanced motion control and optimization algorithms for nano/micro-robots Room 001A Organized & chaired by Alireza Mohammadi / Univ of Michigan-Dearborn, US Mohammad Al Janaideh / University of Guelph, CA		
14:00	Overview of path planning strategies for dexterous microhandling Redwan Dahmouche , M. Gauthier / FEMTO-ST, FR	
14:20	Investigating the response of ferrofluid droplets in a uniform rotating magnetic field: Towards splitting and merging; Masoud Yousefi , M.H. Sarkhosh, M.A. Bijarchi, H.N. Pishkenari / Sharif University of Technology, IR	
14:40	Recent advances in correlative AFM-in-SEM at ISIR lab Mokrane Boudaoud / Sorbonne University, FR	
15:00	Learning to shape liquid droplets on an air-ferrofluid interface with sequences of actuation; P. A. Diluka Harischandra , Q. Zhou / Aalto University, FI	
15:20	Sign gradient descent algorithms for kinetostatic protein folding A. Mohammadi ^a , Mohammad Al Janaideh ^b ^a University of Michigan-Dearborn, US; ^b University of Guelph, CA	
15:40	Automatic sorting of zebrafish embryos using Deep Learning Alioune Diouf ^a , F. Sadak ^a , I. Fassi ^b , M. Boudaoud ^a , G. Legnani ^c , S. Haliyo ^a ^a Sorbonne University, FR; ^b STIIMA-CNR, Milano,IT; ^c Brescia University, IT	
Regular session Micro/Nano robots (II) Room 001C Chair: Jun Liu / City University of Hong Kong, S.A.R., CN		
14:00	Ultrasound manipulation of microrobots in the mouse brain vasculature Alexia Del Campo Fonseca ^a , C. Glück ^b , J. Droux ^b , M. El Amki ^b , D. Ahmed ^a ^a ETH Zurich, CH; ^b University of Zurich, CH	
14:20	Precision guided non-invasive treatment of aneurysms using acoustic robotics Mahmoud Medany , D. Ahmed / ETH Zurich, CH	
14:40	Optoelectronic trajectory reconfiguration and directed self-assembly of self-propelling electrically powered active particles Sankha Shuvra Das , G. Yossifon / Tel-Aviv University, IL	
15:00	SonicPlex: Simultaneous arrangement of massive particles through a simple acoustic micromanipulation platform; Junxian Zhou , R. Liu, M. Wang, T. Wu, W. Dai, X. Zhang, J. Liu / City University of Hong Kong, S.A.R., CN	
15:20	Optimized and validated flow field measurements around ferromagnetic micro-swimmers; Māra Šmite , A.P. Stikuts, A. Cēbers, G. Kitenbergs / Univ of Latvia, LV	
15:40	Design and analysis of a novel multi-mode piezoelectric actuator inspired by the parasitic motion principle; K. Xie, C. Li, Peng Yan , Z. Ren / Shandong Univ, CN	

2. Day – October 11: Parallel technical sessions 14:00 – 16:00	
Regular session Measurement and characterization (III)	
Room 005 Chair: Muhammad Yasir / Univ of Oldenburg, DE	
14:00	Automation and nanorobotics for microwave sensing Kamel Haddadi / University of Lille, FR
14:20	Monolayer graphene sheet qualitative and quantitative characterization by using AFM based SMM Muhammad Yasir / Univ of Oldenburg, DE
14:40	Innovative MEMS stage for automated micromechanical testing Sina Zare Pakzad , B. Ali, S.B. Coban, M. Karimzadehkhoei, B.E. Alaca Koç University, TR
15:00	Influence factors on high frequency primary calibration of single-ended accelerometers Jie Zhou , W. He, Y. Yu / Zhejiang University, CN
15:20	Monolithic glass micro-scale structure including a Bragg grating sensor inscribed with a femtosecond laser Loïc Amez-Droz^a , M. Tunon de Lara ^b , C. Collette ^a , C. Caucheteur ^b , P. Lambert ^c ^a University of Liège, BE; ^b University of Mons, BE; ^c Université libre de Bruxelles, BE
15:40	Fluidic manipulation of a paper origami for oil quality testing Pavithra Sukumar^a , M. Deliorman ^a , F. Castaño ^a , L. Samer Ali ^a , D.H. Abujalban ^b , M. Alu-Datt ^b , M.A. Qasaimeh ^a ^a New York Univ Abu Dhabi, AE ; ^b Jordan Univ of Science and Technology, JO

Technical Program: 3. Day – October 12

3. Day – October 12: Plenary sessions		Auditorium
08:30 – 10:30 Plenary talks Chair: Lauren D. Zarzar / Pennsylvania State Univ, US		
08:30	Interactive microrobotic systems for scientific instrumentation Sinan Haliyo / Sorbonne University, FR	
09:10	Understanding the adhesion of 1D and 2D nanomaterials Han Huang / University of Queensland, AU	
09:50	Microfluidic manipulation of biomolecules, cells, and biochemical assay reagents for high-performance immunosensors Katsuo Kurabayashi Tandon School of Engineering, New York University, US	
16:30 – 17:50 Plenary talks Chair: Li Zhang / Chinese Univ of Hong Kong, S.A.R., CN		
16:30	Magnetic helical nanobots: From intracellular biophysics to fantastic voyage Ambarish Ghosh / Indian Institute of Science, Bangalore, IN	
17:10	Pushing the limit in operating within confined spaces with small-scale soft robotics Kanty Rabenoroso / FEMTO-ST, FR	
17:50 – 19:00 Closing & Awards ceremony		

3. Day – October 12: Parallel technical sessions 11:00 – 13:00	
Special session Lecture Hall	Matter in motion Organized & chaired by Salvador Pané i Vidal / ETH Zurich, CH Josep Puigmartí-Luis / University of Barcelona, ES
11:00	Protein-based chemical motors for modular propulsion of microrobots Abdon Pena Francesch / University of Michigan, US
11:20	Anisotropic soft materials for small-scale robotics: From liquid crystal elastomers to hydrogels; Hamed Shahsavan / University of Waterloo, CA
11:40	Development of a squid-inspired pneumatic soft robot and its jet propulsion Bumjin Jang / Hanyang University, KR
12:00	Reconfigurable micro-metastructures with wide-spectrum programmability actuated by hydrogel muscle; Mingchao Zhang / MPI for Intelligent Systems, DE
12:20	Tailoring photoactive microrobots for selective target recognition and removal Katherine Villa / Institute of Chemical Research of Catalonia, ES
12:40	HASEL artificial muscles for a new generation of bioinspired, lifelike robots Daniela Macari / Max Planck Institute for Intelligent Systems, DE
Special session Room 004	Microwave multiscale modelling and characterization Organized & chaired by Kamel Haddadi / University of Lille, FR Mohamed A. Abou-Khousa / Khalifa University, Abu Dhabi, AE
11:00	New graphene-based composites in electromagnetic interference shielding Svetlana P. Jovanovic^a , K. Haddadi ^b / ^a Univ of Belgrade, RS; ^b Univ of Lille, FR
11:20	Microwave electromagnetic shielding with free-standing composites based on graphene oxide and silver nanowires Duška Kleut^a , M. Milenkovic ^a , F. von Kleist-Retzow ^b , M. Sebbache ^c , K. Haddadi ^c , S.P. Jovanovic ^a / ^a University of Belgrade, RS; ^b ZEISS-SMT; ^c University of Lille, FR
11:40	Automated detection of metal surface defects using waveguide-fed circular aperture probe O.S. Hassan, A.A. Mustapha, Mohamed A. Abou Khousa / Khalifa Univ, AE
12:00	Enhancing water treatment residuals characterization through MNDT-assisted dielectric properties investigation via oven heating Zuhani Ismail Khan , M.F. Mohd Zain, Z. Suboh, M.K.A. Mahmood, N.A.Z. Zakaria, N.E.A. Rashid / MARA Univ of Technology, MY
12:20	Moisture-based doneness assessment of chicken meat using complimentary splitting resonator: Preliminary study; M.F.S., Zulkeflee, M.F. Sapuri, F.A.Mohd Kasran, N.A.Z. Zakaria, Siti Amalina Enche Ab Rahim / MARA Univ of Technology, MY

3. Day – October 12:		Parallel technical sessions	11:00 – 13:00
Special session		Collective behavior and emergent functionalities in microrobotic swarms (III)	
Room 001A		Organized by Ayusman Sen & Igor S. Aronson / Penn State Univ, US Chaired by Tania Patino / Eindhoven University of Technology, NL	
11:00	Dual enzyme loaded peptide nanotube-based functional motors C. Ghosha, Dibyendu Das / Indian Inst of Sci Education and Research, Kolkata, IN		
11:20	Targeted vibration-induced necrosis in liver cancer cells using paramagnetic microrobots/S. Mallick, M. Sokolich, D. Rivas, Sambeeta Das /Univ of Delaware, US		
11:40	Reciprocal and non-reciprocal interactions between active particles Ayusman Sen / Pennsylvania State University, US		
12:00	Synergistic effect of swarms of enzyme nanorobots for crossing biological barriers Samuel Sanchez / Inst for Bioeng of Catalonia, Catalan Inst for Res & Adv Studies		
12:20	Pathway to “intelligence”: Using stimuli-responsive materials for creating self-powered autonomous functional systems / Siowling Soh / NUS, SG		
Regular session		Measurement and characterization (IV)	
Room 005		Chair: Victor Koledov / Kotelnikov Inst of Radioeng & Electr, RAS, RU	
11:00	Multi-modal microfluidic bend sensor for soft and robotic sensing applications Wael Othman , M.A. Qasaimeh / New York University Abu Dhabi, AE		
11:20	Integration of the nanowire-based Field Effect Transistors for micro-bio-sensing using nanomechanical tools with Shape Memory Effect; Victor Koledov ^a , S.v.Gratowski ^a , P.Lega ^a , A.Orlov ^a , S.Romanov ^a , A.Pavlov ^a , A.Prokunina ^a , V.Shavrov ^a , N.T. Hong Le ^b , V.H. Ky ^b , T.N. Bach ^b , P.T. Thu ^b , D.H. Manh ^b , A.Irzhak ^c , M.Evstafjeva ^c ^a Kotelnikov Inst of Radioengineering and Electronics, RAS, RU; ^b Inst of Materials Sci, VAST, Hanoi, VN; ^c Ins of Microelectr. Tech & High-Purity Materials, RAS, RU		
11:40	Miniaturized optical-fiber force sensing probe for surgical instrument end effector Gen Li , T. Zhang, X. Yang, Y. Shen / Hong Kong Univ of Sci and Tech, S.A.R., CN		
12:00	Microrobotic system for activation of the insect sensilla on the base of microtweezers with Shape Memory Effect/ V.Koledov ^a , S.v.Gratowski ^a , Vladimir Shavrov ^a , M.Zukovskaya ^b , A.Lunickin ^b , N.Sitnikov ^c , A.Shelyakov ^c , K.Borodako ^c , S.Petrenko ^c ^a Kotelnikov Inst of Radioeng and Electronics, RAS, RU; ^b Sechenov Inst of Evolut. Physiology and Biochemistry, RU; ^c National Research Nuclear Univ MEPhI, RU		
12:20	Fundamentals of creating biosensors based on nanowires by mechanical assembly methods; Peter Lega ^a , A.Orlov ^a , A.Vaulinskaya ^b , A.Irzhak ^c , S.v.Gratowski ^a , V.Koledov ^a , N.T.Hong Le ^d ; ^a Kotelnikov Inst of Radioengineering and Electronics, RAS, RU; ^b Bauman Moscow State Univ, RU; ^c Ins of Microelectr. Tech & High-Purity Materials, RAS, RU; ^d Inst of Materials Sci, VAST, Hanoi, VN		

3. Day – October 12:		Parallel technical sessions	11:00 – 13:00
Regular session		Micro/Nano robots (III)	
Room 001C		Chair: Khalil B. Ramadi / New York University Abu Dhabi, AE	
11:00	Micro clusters of cardiac cells as natural actuators: Experiment and theory Valentin L. Popov^a , K. Nakano ^b / ^a TU Berlin, DE; ^b Yokohama National Univ, JP		
11:20	Targeted Radical Polymerization (TRAP) technology: Transforming non-invasive theranostics in vivo; Sarvesh Kumar Srivastava / Indian Inst of Tech, Delhi, IN		
11:40	Detection of endovascular morphology utilizing sensor-integrated and magnetically actuated guidewire head Wenkang Wang , S. Song, W. Hu / Max Planck Inst for Intelligent Syst, Stuttgart, DE		
12:00	Nematocysts (jellyfish stinging capsules) based biohybrid microrobots for deep penetration of molecules into the cancer spheroids; Sinwook Park^a , N. Barak ^b , T. Lotan ^b , G. Yossifon ^a / ^a Tel-Aviv University, IL; ^b University of Haifa, IL		
12:20	Bio-inspired design of ingestible devices for sustained engagement with the gastric mucosa; Khalil B. Ramadi / New York University Abu Dhabi, AE		

3. Day – October 12: Parallel technical sessions 14:00 – 16:00	
Special session Lecture Hall	Bioinspired materials and design in small-scale soft robotics Organized & chaired by Abdon Pena-Francesch / University of Michigan, US Hamed Shahsavan / University of Waterloo, CA
14:00	Biotemplating of functional nanomaterials into magnetically driven microrobots for biomedical applications; Carlos Franco Pujante / ETH Zurich, CH
14:20	Porous crystalline materials in motion Josep Puigmartí Luis / University of Barcelona, ES
14:40	How to design and actuate muscle based biobots across scales Maria Guix Noguera / University of Barcelona, ES
15:00	Liquid crystalline elastomers as a material platform for actuation and autonomous adhesion applications; Mohand Saed / Univ of Cambridge, UK
15:20	Various degradable microrobots for cell and drug delivery Hongsoo Choi / Daegu-Gyeongbuk Inst of Sci and Tech (DGIST), KR
15:40	Magneto-mechanical substrate deformation regulates astrocyte local stiffness and calcium dynamics modulated by actin networks Daniel Garcia Gonzalez / University Charles III of Madrid, ES
Special session Room 001A	Physical principles and control strategies for acoustic micromanipulation Organized & chaired by Selman Sakar / EPFL, CH Michael Baudoin / University of Lille, FR Amit Dolev / EPFL, CH
14:00	Robotic acoustic microscale manipulation system based on GHz acoustic streaming Xuexin Duan / Tianjin University, CN
14:20	Non-destructive reconstruction of ultrasonic acoustics with the acousto-optic effect Izhak Bucher / Technion, IL
14:40	Acoustic actuation in microbubbles and hollow/solid microparticles: Exploring physical principles Amirreza Aghakhani / University of Stuttgart, DE
15:00	Acoustic micromanipulation using holographic micro-tweezers Michael Baudoin / University of Lille, FR
15:20	Acoustic actuation of soft robotic microdevices Selman Sakar / EPFL, CH

3. Day – October 12: Parallel technical sessions 14:00 – 16:00	
Special session	
Room 004	
Microfluidic manipulation of small objects on chip	
Organized & chaired by	
Yong-Ak (Rafael) Song / New York University Abu Dhabi, AE	
14:00	3D manipulation of small multicellular organisms by a soft microtubing S. Alnajjar, L. Alkasaji, T. Hayek, A. Orozaliev, Yong-Ak Song New York University Abu Dhabi, AE
14:20	Limitations of the non-floating actuation scheme in digital microfluidic devices M. Al-Lababidi, Mohamed Abdelgawad / American University of Sharjah, AE
14:40	Numerical characterization of compliance of thick PDMS microchannels Mohammed E. Elgack , O. Ghannam, M. Abdelgawad / American Univ of Sharjah, AE
15:00	Development and characterization of a COC pillars-based microfluidic device for nanoparticle separation Fadi Dawaymeh , A. Agha, M. Khaleel, E. Abu-Nada, A. Alazzam, N. Alamoodi Khalifa University, Abu Dhabi, AE
15:20	Gut-liver-axis on a Chip for studying disease progression in vitro Ken-ichiro Kamei / New York University Abu Dhabi, AE
Regular session	
Room 005	
Positioning and control (II)	
Chair: Uche Wejinya / University of Arkansas, US	
14:00	Adaptive PI-Fuzzy like control of a stack pneumatic actuators testbed for multi-configuration small scale soft robotics Ammar K. Al Mhdawi ^a , N. Wright ^b , A.J. Humaidi ^c , A.T. Azar ^d ^a Edge Hill Univ, UK; ^b Newcaslte Univ, UK; ^c Univ of Tech, Baghdad, IQ; ^d Prince Sultan Univ, SA
14:20	Modular Wavelength Adaptation of the Dynamic Optical MicroEnvironment Neshika Wijewardhane , M. Uppington, M. How, H. Hauser, E. Piddini, S. Hauert University of Bristol, UK
14:40	Robotic system for veterinary applications K. Spanoudes ^a , Christakis Damianou ^b / VET EX Machina, CY; Cyprus U of Tech, CY
15:00	Shadow masking for nanoscale patterning of miniaturized sensors B. Ali ^a , M. Karimzadehkhoei ^a , M.N. Esfahani ^b , Y. Leblebici ^c , B. Erdem Alaca ^a ^a Koç Univ, TR; ^b Univ of York, UK; ^c Swiss Federal Inst of Tech Lausanne (EPFL), CH
15:20	Optimized PID control for a piezoelectric bending microactuator M. Musa, Uche Wejinya / University of Arkansas, US

3. Day – October 12: Parallel technical sessions 14:00 – 16:00	
Regular session	Automation
Room 001C	Chair: Reza Moheimani / University of Texas at Dallas, US
14:00	A novel actuator based on near-field acoustic levitation and electromagnetic actuation K. S. Vikrant , H.M. Nasrabadi, R.Moheimani / Univ of Texas at Dallas, US
14:20	Scalable, compact and easy-to-control linear electromagnetic actuator Jakub Tureček , J. Kuthan, M. Vitek, M. Juřík, F. Mach / Univ of West Bohemia, CZ
14:40	Deep Learning-based approach for optical microrobot tracking, pose prediction and trapping points localization Ferhat Sadak , E. Gerena, S. Haliyo / Sorbonne University, FR
15:00	Robot-assisted acoustofluidic end-effector for microscale particle manipulation J. Durrer ^a , P. Agrawal ^a , A. Ozgul ^a , S. Neuhaus ^b , N. Nama ^c , Daniel Ahmed ^a ^a ETH Zurich, CH; ^b University of Zurich, CH; ^c University of Nebraska-Lincoln, US
15:20	Enhanced motion control of magnetically and electrically powered hybrid micromotor: Open-loop and close-loop control S. Park, Y. Katz, Ido Rachbuch , G. Yossifon / Tel-Aviv University, IL