

Technical Program: 1. Day – July 19

1. Day – July 19: Plenary sessions		Room 1
09:00 – 10:40 Keynote talks Chair: David J. Cappelleri / Purdue Univ, US		
09:00	Mobile micromanipulation using untethered magnetic microrobots Metin SITTI / MPI-IS, DE; Carnegie Mellon Univ, US	
09:50	Microtubular NEMS for on- and off-chip applications Oliver G. SCHMIDT / IFW Dresden, DE; Technical Univ Chemnitz, DE	
11:00 – 13:00 Plenary talks Chair: Hongsoo Choi / DGIST, KR		
11:00	Independent actuation of multiple microrobots using localized magnetic fields S. Chowdhury, W. Jing, David J. Cappelleri Purdue Univ, US	
11:30	Compliant continuous-locking micro mechanism S. van Bracht ^{a,b} , G. Semon ^c , Just L. Herder^a , Nima Tolou^a ^a Delft Univ of Tech, NL; ^b Flexous BV, NL; ^c TAG Heuer, CH	
12:00	High-speed single-stage and dual-stage mirror scanners Yuen K. Yong , S. P. Wadikhaye, A. J. Fleming Univ of Newcastle, AU	
12:30	Alemnis SEM Indenter, a tailored instrument for mechanical testing at the micro- and nano-scale (Industrial presentation) Jean-Marc Breguet / Alemnis	
16:20 – 17:50 Plenary talks Chair: Yuen K. Yong / Univ of Newcastle, AU		
16:20	Automated detection of live cells and microspheres in low contrast bright field microscopy M. Bollavaram ^a , P. Sane ^b , S. Chowdhury ^c , S. Gupta ^d , Ashis Banerjee^a ^a Univ of Washington, US; ^b IIT Gandhinagar, IN; ^c Purdue Univ, US; ^d Univ of Southern California, US	
16:50	Rapid 3D printing of complex polymeric tubular catalytic micromotors Mariana Medina-Sánchez , M. Guix, S. Harazim, L. Schwarz, O. G. Schmidt Leibniz Institute for Solid State and Materials Research Dresden (IWF), DE	
17:20	Microrobots for cell therapy Hongsoo Choi Daegu Gyeongbuk Institute of Science & Technology (DGIST), KR	

1. Day – July 19: Parallel technical sessions		14:00 – 16:00
1-TS1 Room 1	Diamagnetic micro robotics: from levitation to massive parallelism (Special session) Organized & chaired by Ron Pelrine SRI International, US	
14:00	Application of micro robots for building carbon fiber trusses Allen Hsu , A. Wong-Foy, B. McCoy, C. Cowan, J. Marlow, B. Chavez, T. Kobayashi, D. Shockey, R. Pelrine / SRI Int., US	
14:24	Parallel microrobotic assembly: Many hands make light work, and management challenges D.L. Christensen ^a , H. Martirosyan ^a , K. Hahm ^a , A. Hsu ^b , R. Pelrine ^b , A. Wong-Foy ^b , Mark Cutkosky ^a / ^a Stanford Univ, US; ^b SRI Int., US	
14:48	Optimal control of diamagnetically levitated milli robots using automated search patterns Ron Pelrine , A. Hsu, A. Wong-Foy, B. McCoy, C. Cowan / SRI Int., US	
15:12	Batch-fabrication of magnetically patterned bases for diamagnetically levitated micro-robots Camilo Velez Cuervo / Univ of Florida, US	
15:36	Self-assembly of milli-scale robotic manipulators: A path to highly adaptive, robust automation systems R. Pelrine, Annjoe Wong-Foy , A. Hsu, B. McCoy / SRI Int., US	
1-TS2 Room 4	Mechanical characterization of nanostructures and ultrathin films (Special session) Organized & chaired by Han Huang Univ of Queensland, AU	
14:00	Probing the fundamental size dependence of hardness by nano-indentation/nano-scratch with implications on Instrumented Indentation Testing (IIT) standardisation Xiaodong Hou / National Physical Laboratory, UK	
14:24	Moving and monitoring MEMS with light Mariusz Martyniuk / Univ of Western Australia, AU	
14:48	Fabrication and characterisation of nanoscale structures on Si wafer using nanoscratching and molecular dynamics simulation Jun Shimizu / Ibaraki Univ, JP	
15:12	Dynamic characterization and mass sensing of thin-film diaphragms Shujun Ma / Northeastern Univ, CN	
15:36	Nanoscale kinetic friction characterization through optical nanomanipulation Aditi Roy / Univ of Queensland, AU	

1. Day – July 19: Parallel technical sessions		14:00 – 16:00
1-TS3		Measurement & Characterization (I)
Room 2		Chaired by Tobias Tiemerding / Univ Oldenburg, DE
14:00	An in situ indentation system for high dynamics nanomechanical measurements Serge Grop^{a,b} , J. Schwiedrzik ^a , J. P. Best ^a , G. Guillonneau ^c , Q. Longchamp ^b , J. Michler ^a , J.-M. Breguet ^{a,b} / ^a EMPA, CH; ^b Alemnis; ^c Ecole Centr. de Lyon, FR	
14:24	Contact mode imaging using AFM probes with exchangeable tips R. Sri Muthu Mrinalini , G. R. Jayanth / Indian Inst of Science, Bangalore, IN	
14:48	Modularized SPM-Controller based on an FPGA for combined AFM and SMM measurements M. Wiegand ^a , Tobias Tiemerding^b , O. Haenssler ^{a,c} , S. Fatikow ^a ^a Univ of Oldenburg, DE; ^b OFFIS, DE; ^c Univ of Lille, FR	
15:12	Measurement of surface potential and adhesion with Kelvin probe force microscopy Hao Zhang , D. Hussain, X. Meng, J. Song, H. Xie / Harbin Inst of Tech, CN	
15:36	Optomechanical force estimation using passive micromanipulator end-effectors Maura Power , G.-Z. Yang / Imperial College London, UK	
1-TS4		Automation
Room 3		Chaired by Travis L. Massey / Univ of California, Berkeley, US
14:00	Path planning in the AFM nanomanipulation of multiple spherical nanoparticles by using a co-evolutionary Genetic Algorithm Ali Kafash Hoshiar^a , M. Kianpour ^a , M. Nazarahari ^b , M. H. Korayem ^b ^a Islamic Azad Univ of Qazvin, IR; ^b Iran Univ of Science and Tech, Tehran, IR	
14:24	Object tracking in robotic micromanipulation by supervised ensemble learning classifier Zoran Cenev , J. Venäläinen, V. Sariola, Q. Zhou / Aalto Univ, Espoo, FI	
14:48	An automatic optical system for micro-defects inspection on 5 surfaces of a chip / Chih-Wen Chen , M.-F. Chen, C.-Y. Chen, C.-H. Hwang, C.-C. Chou Instrument Technology Research Center, Hsinchu, TW	
15:12	Open-source automated system for assembling a high-density microwire neural recording array Travis L. Massey^a , J. H. Lee ^a , M. Ray ^a , N. S. Sathe ^a , X. Liu ^b , K. S. J. Pister ^a , M. M. Maharbiz ^a / ^a Univ of California, Berkeley, US; ^b Tsinghua Univ, CN;	
15:36	Planning trajectories for dexterous in-hand micro-manipulation using adhesion forces Jean-Antoine Seon , R. Dahmouche, M. Gauthier / FEMTO-ST, FR	

1. Day – July 19: Parallel technical sessions		14:00 – 16:00
1-TS5	Micro/Nano Positioning	
Room 5	Chaired by Maria Guix Noguera / IWF Dresden, DE	
14:00	Performance improvement of optical mouse sensors: Application in a precision planar stage A. Alvarez-Aguirre, G. Mok, S. Hassan HosseinNia , J. Spronck Delft Univ of Technology, NL	
14:20	Development of a dexterous haptic micro/nanomanipulator utilizing a hybrid parallel-serial flexure mechanism Joshua Pinski^a , B. Shirinzadeh ^a , Y. Qin ^b , L. Clark ^a ^a Monash Univ, AU; ^b Nankai Univ, CN	
14:40	Development of an electrothermal micro positioning platform for laser targets with two degrees of freedom Christian Nakic , J. Bieker, D. Lämmle, T. Winterstein, H. F. Schlaak, G. Schaumann, T. Abel / TU Darmstadt, DE	
15:00	A fractional-order active damping control approach for piezo-actuated nanopositioning stages Lin-Lin Li , G.-Y. Gu, L.-M. Zhu / Shanghai Jiao Tong Univ, CN	
15:20	Shape modulation of free stimuli-responsive microstructures for small scale robotics V. Magdanz, Maria Guix Noguera , M. Medina-Sánchez, O. G. Schmidt Leibniz Institute for Solid State and Materials Research Dresden (IWF), DE	
15:40	A temperature-dependent control technique for a highly sensitive piezoelectric actuator Didace Habineza , M. Zouari, M. Rakotondrabe, Y. L. Gorrec FEMTO-ST, FR	

Technical Program: 2. Day – July 20

2. Day – July 20: Plenary sessions		Room 1
09:00 – 10:40 Keynote talks Chair: Tie Li / SIMIT-CAS, CN		
09:00	Three dimensional femtosecond laser processing: an enabling technology for microrobotics and micromanipulation Yves BELLOUARD / EPFL, CH	
09:50	Force microscopy based nanorobotic system for multiscale manipulation and multiparametric characterization Hui XIE / Harbin Inst of Technology, CN	
11:00 – 12:00 Plenary talks Chair: Stefano Scheggi / Univ of Twente, NL		
11:00	Towards on-chip single cell manipulation of trap and rotation L. Huang, L. Tu, X. Zeng, L. Mi, X. Li, Wenhui Wang / Tsinghua Univ, CN	
11:30	In-situ wafer-level fabricated high-performance micro/nano gas sensor Tie Li / Shanghai Inst of Microsystem and Information Technology (SIMIT), Chinese Academy of Sciences, CN	
12:00 – 13:00 Industrial Panel Moderator: Kornel F. Ehmann Northwestern Univ, US		
MARSS2016 offers a moderated plenary Industrial Panel discussion with the members of MARSS Industrial Advisory Board and other industry representatives attending the conference. All MARSS2016 participants are invited to join the discussion. Also do not miss the on-site exhibition organized by the participating companies.		
16:20 – 18:20 Plenary talks Chair: Wenhui Wang / Tsinghua Univ, CN		
16:20	Integration of different hardware interfacing protocols into a robotic software framework P. Elfert, Tobias Tiemerding , S. Fatikow / Univ of Oldenburg, DE	
16:50	Rapid injection of single magnetic nanobead into a specific living cell using laser-assisted injection J. Zhong, H. Liu, H. Maruyama, T. Masuda, Fumihito Arai / Nagoya Univ, JP	
17:20	Durability of silicon pin-joints for microrobotics Daniel S. Contreras , K. S. J. Pister / Univ of California, Berkeley, US	
17:50	An experimental comparison of path planning techniques applied to micro-sized magnetic agents Stefano Scheggi ^a , Sarthak Misra ^{a,b} / ^a Univ of Twente, NL; ^b Univ of Groningen & Univ. Medical Centre Groningen, NL	

2. Day – July 20: Parallel technical sessions		14:00 – 16:00
2-TS1 Room 1	Design and control of precision mechatronic systems (Special session) Organized & chaired by Yuen Kuan Yong / Univ of Newcastle, AU Kam K. Leang / Univ of Utah, US	
14:00	Design and control of a 3D-printed microindention system Xinyu Liu / McGill Univ, CA	
14:24	Design and stiffness analysis of a XYZ scanning stage Kunhai Cai , Y. Tian, L. Cui, Z. Yang, D. Zhang / Tianjin Univ, CN	
14:48	3D-printing: a promising technology to design three-dimensional microsystems D. Gendreau, Abdenbi Mohand Ousaid , P. Rougeot, M. Rakotondrabe FEMTO-ST, FR	
15:12	Design of a compliant constant force gripper mechanism based on buckled fixed-guided beam Yilin Liu , Q. Xu / Univ of Macau, Macau SAR, CN	
15:36	High sensitivity interferometer for on-axis detection of AFM cantilever deflection B. Routley, A. Fleming / Univ of Newcastle, AU (presented by Yik Ren Teo / Univ of Newcastle, AU)	
2-TS2 Room 4	Advanced sensors (Special session) Organized & chaired by Tie Li / SIMIT, Chinese Academy of Sci, CN	
14:00	High performance sensors based on graphene hybrid materials for environmental monitoring applications Xiaohong Wang / Tsinghua Univ, CN	
14:24	An ultra-thin silicon stress sensor array for measurement of stress and strain on curved surfaces Zheyao Wang / Tsinghua Univ, CN	
14:48	The effect of spring elasticity coefficient on the characteristics of electrochemical seismic sensor based on the MEMS technology G. Li, J. Wang, Deyong Chen , Y. Xing, J. Chen, Z. Sun State Key Lab of Transducer Technology, CAS, CN	
15:12	A piezoresistive flowmeter Huiquan Wang / Zhejiang Univ, CN	
15:36	Complementary PH detection based on integrated n- and p- type nanowires in a single chip Anran Gao / SIMIT, CAS, CN	

2. Day – July 20: Parallel technical sessions		14:00 – 16:00
2-TS3		Measurement & Characterization (II)
Room 2		Chaired by U-Xuan Tan / Singapore Univ of Tech & Design, SG
14:00	Estimation of interaction forces between two magnetic bolus-like microrobots Lyès Mellal^a , D. Folio ^a , K. Belharet ^b , A. Ferreira ^a ^a Univ of Orléans, FR; ^b Hautes Études d'Ingénieur Campus Centre, FR	
14:24	Wide bandwidth sensing of micro angular motion Y. Fan, H.-Y. Li, L. Yang, U-Xuan Tan / Singapore Univ of Tech & Design, SG	
14:48	Twin-scale visual method for nanoposition and microforce measurements with large range-to-resolution ratio / Valérian Guelpa , P. Sandoz, C. Clévy, N. Le Fort-Piat, G, J. Laurent / FEMTO-ST, FR	
15:12	Polar body detection for ICSI cell manipulation Amir M. Hajiyavand , M. Saadat, A.-P. Singh Bedi / Univ of Birmingham, UK	
15:36	An experimental study on the displacement amplification mechanism driven by piezoelectric actuators for jet dispenser Young-Bog Ham^a , B.-C. An ^a , M. A. Trimzi ^a , G.-T. Lee ^b , J.-H. Park ^b , S.-N. Yun ^b ^a Univ of Science and Technology, Daejeon, KR; ^b KIMM, KR	
2-TS4		Micro/Nano Robots
Room 3		Chaired by Stefano Palagi / MPI-IS, DE
14:00	Easily scalable high speed magnetic micropropellers Lukas Schwarz , M. Medina-Sánchez, O. G. Schmidt / IWF Dresden, DE	
14:20	Novel mobile piezoelectric micro robots driven by traveling wave Chi Hsiang Pan / National Chin-Yi Univ of Technology, TW	
14:40	Wireless actuator based on ultrasonic bubble streaming Tian Qiu^{a,b} , S. Palagi ^a , A. G. Mark ^a , K. Melde ^a , P. Fischer ^{a,c} ^a MPI-IS, DE; ^b EPFL, CH; ^c Univ of Stuttgart, DE	
15:00	A gripper based on a compliant bistable mechanism for gripping and active release of objects T.-A. Nguyen, Dung-An Wang / National Chung Hsing Univ, TW	
15:20	Soft continuous microrobots with multiple intrinsic degrees of freedom Stefano Palagi^a , A. G. Mark ^a , K. Melde ^a , H. Zeng ^b , C. Parmeggiani ^{b,c} , D. Martella ^b , D. S. Wiersma ^b , P. Fischer ^{a,d} ^a MPI-IS, DE; ^b Univ of Florence, IT; ^c CNR-INO, IT; ^d Univ of Stuttgart, DE	
15:40	Development of cylindrical elastic crawler for 25A pipe inspection J. Nagase, Fumika Fukunaga / Ryukokou Univ, JP	

2. Day – July 20: Parallel technical sessions		14:00 – 16:00
2-TS5	Manipulation and Control	
Room 5	Chaired by Alper Denasi / Univ of Twente, NL	
14:00	Repeatable and precise position control of a magnetic microparticle in ambient environments A. Bolopion ^a , S. Bouchebout ^b , Stéphane Régnier ^b ^a FEMTO-ST, FR; ^b ISIR-UPMC, FR	
14:24	Boltzmann law-based control of localized electrophoretic particle deposition and manipulation David Pritchett , J. Cao, K. Ehmann, J. Huang / Northwestern Univ, US	
14:48	A robust controller for micro-sized agents: The prescribed performance approach Alper Denasi ^a , S. Misra ^{a,b} / ^a Univ of Twente, NL; ^b Univ of Groningen & Univ. Medical Centre Groningen, NL	
15:12	Improved three-dimensional remote aggregations of magnetotactic bacteria for tumor targeting Dumitru Loghin , C. Tremblay, S. Martel/ Polytechnique Montréal, CA	
15:36	Single particle manipulation/sorting through the transient response of thermocapillary convection flows Johan E. Quispe ^a , J. C. Inga ^a , E. M. Muñoz ^a , S. Régnier ^b , E. Vela ^a ^a Univ de Ingeniería y Tecnología, Lima, PE; ^b ISIR-UPMC, FR	

Technical Program: 3. Day – July 21

3. Day – July 21: Plenary sessions		Room 1
09:00 – 10:40 Keynote talks		Chair: Arianna Menciassi / SSSA, IT
09:00	Nano-/micro-mobility and its applications Dong-Yol YANG / Gwangju Inst of Science and Technology, KR	
09:50	Multiphysics modeling for nanorobotics in biology and nanomedicine Antoine FERREIRA / Univ of Orléans, FR	
11:00 – 13:00 Plenary talks		Chair: Dong Sun / City Univ of HK, SAR, CN
11:00	Magnetic milli/micro robotic solutions for medical applications G. Lucarini, V. Iacovacci, L. Ricotti, Arianna Menciassi Scuola Superiore Sant'Anna, IT	
11:30	Two-agent formation control of magnetic microrobots M. Salehizadeh, Eric Diller / Univ of Toronto, CA	
12:00	Compliant mechanism based nanopositioners and manipulators: Design and applications Xianmin Zhang / South China Univ of Technology (SCUT), CN	
12:30	Optical tweezers with 3D high speed force feedback M. Yin ^a , E. Gerena ^a , Stephane Régnier^a , C. Pacoret ^b ^a ISIR-UPMC, FR; ^b Univ of Geneva, CH	
16:20 – 17:20 Plenary talks		Chair: Eric Diller / Univ of Toronto, CA
16:20	A simple and efficient intracellular delivery using a magnetic rod manipulation R. Wang, Y. T. Chow, Dong Sun / City Univ of Hong Kong, SAR, CN	
16:50	Directed micro assembly of passive particles at fluid interfaces using magnetic robots Denise Wong , I. B. Liu, E. B. Steager, K. J. Stebe, V. Kumar Univ of Pennsylvania, US	
17:20 – 18:30 Award ceremony		
Closing session		
19:00 – 21:00 MARSS2016 Banquet		

3. Day – July 21: Parallel technical sessions		14:00 – 16:00
3-TS1	Compliant mechanisms and manipulation (Special session)	
Room 1	Organized & chaired by Xianmin Zhang South China Univ of Technology (SCUT), CN	
14:00	Strain-based output/input sensing cell integrated within a compliant bridge-type mechanism Zhong Chen , W. Cao, X. Jiang, X. Zhang / SCUT, CN	
14:20	A solid isotropic material with parallel penalization method for structural topology optimization with multiple materials Nianfeng Wang , X. Zhang / SCUT, CN	
14:40	Mechanism design of underactuated robotic hand Yanjiang Huang , X. Zhang, J. Zhang, C. Huang / SCUT, CN	
15:00	A novel mixed asperity based friction model Yunzhi Zhang , X. Zhang / SCUT, CN	
15:20	Adaptive control for piezoelectric actuator using direct inverse modeling approach Jinqiang Gan , X. Zhang / SCUT, CN	
15:40	A novel compliant orthogonal displacement amplification mechanism and its application in micro-grasping Weilin Chen ^a , X. Zhang ^a , S. Fatikow ^b / ^a SCUT, CN; ^b Univ of Oldenburg, DE	
3-TS2	Microbiorobotic systems for biomedical applications (Special session)	
Room 4	Organized & chaired by Hongsoo Choi Daegu Gyeongbuk Institute of Science & Technology (DGIST), KR	
14:00	Development of remote controlled medical micro-robot with variable stiffness Hongsoo Choi / DGIST, KR	
14:24	The study of micro-magnetic induction antenna for wireless signal and power transmission Jae-Eun Jang / DGIST, KR	
14:48	Hollow magnetic helical microswimmers: Fabrication, disassembly and applications Li Zhang / Chinese Univ of HK, SAR, CN	
15:12	On-chip microrobotic swimmers for biological applications Gilgueng Hwang / CNRS-LPN, FR	
15:36	Accurate control of microrobot using magnetic fields Jonghyun Kim / DGIST, KR	

3. Day – July 21: Parallel technical sessions		14:00 – 16:00
3-TS3 Design and Fabrication		
Room 2 Chaired by Nima Tolou / Delft Univ of Tech, NL		
14:00	Flexible polymer/multi-walled carbon nanotube composite sensor array equipped with microheater for gas sensing Chin-Cheng Wu^a , J.-C. Chiou ^a , Y.-P. Wang ^b , L.-C. Wang ^b ^a National Chiao Tung Univ, TW; ^b National Chung-Shan Inst of Sc & Tech, TW	
14:24	Virtual-work-based optimization design of compliant transmission mechanism for flapping-wing aerial vehicles Chao Zhang^a , C. Rossi ^a , W. He ^a , J. Colorado ^b ^a Univ Politécnica de Madrid, ES; ^b Pontificia Univ Javeriana, Bogotá, CO	
14:48	Design and evaluation of flexural harmonic probes for multifrequency atomic force microscopy R. Sriramshankar , G. R. Jayanth / Indian Inst of Science, Bangalore, IN	
15:12	Strain gauges based force sensor for precision assembly of helix slow-wave structure Jimin Liang , G. Zhang, X. Chen, W. Wang Guangzhou Inst of Advanced Tech, CAS, CN	
15:36	Design and calibration of 3D-printed micro force sensors Juntian Qu , Q. Wu, T. Clancy, X. Liu / McGill Univ, CA	
3-TS4 Bio/Nano Materials		
Room 3 Chaired by Marlitt Viehrig / Tampere Univ of Technology, FI		
14:00	Nanocar & nanotruck motion on gold surface Alireza Nemati , H. N. Pishkenari, A. Meghdari, S. Shorabpour Sharif Univ of Technology, Tehran, IR	
14:24	Drug-induced changes of membrane tethers and its contributions for cell adhesion / Yang Liu^a , Y. Shen ^a , H. Lu ^a , X. Wang ^b , Z. Wang ^b ^a City Univ of HK, SAR, CN; ^b Changchun Univ of Science and Technology, CN	
14:48	Challenges and capabilities of conductive polymeric materials for electromechanical stimulation of stem cells – A case study Marlitt Viehrig , S. Tuukkanen, P. Kallio / Tampere Univ of Technology, FI	
15:12	Investigation of extraordinary optical transmission properties for double-layered nano-hole perforated gold films X. Li ^a , B. Xu ^b , L. Tu ^a , Wenhui Wang^a ^a Tsinghua Univ, CN; Beijing Tongfang Biochip Technology Co, CN	
15:36	A closer look at the motion of p-carborane on gold surface S. M. H. Lavasani, H. N. Pishkenari, A. Meghdari (pres. by Alireza Nemati) Sharif Univ of Technology, Tehran, IR	