

# **2018 International Conference on Manipulation, Automation and Robotics at Small Scales (MARSS 2018)**

**Nagoya, Japan  
4-8 July 2018**



IEEE Catalog Number: CFP18D58-POD  
ISBN: 978-1-5386-4842-1

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18D58-POD
ISBN (Print-On-Demand):	978-1-5386-4842-1
ISBN (Online):	978-1-5386-4841-4

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Table of Contents - Full Papers

Locomotion of Microstructures Driven by Algae cells .....	<i>Xiaodong Wang, Niandong Jiao, Steve Tung and Lianqing Liu</i>
Motion control of the piezoelectric tube scanner for Lissajous trajectories with modified repetitive control.....	<i>Linlin Li, Guoying Gu and Li-Min Zhu</i>
A Novel Biopsy Capsule Endoscope for Wireless Intestinal Tissue Collection.....	<i>Viet Ha Le, Manh Cuong Hoang, Van Du Nguyen, Eunpyo Choi, Jayoung Kim, Byungjeon Kang, Chang-Sei Kim and Jong-Oh Park</i>
Implementation Scheme of Orbital Refueling Using Microsatellite.....	<i>Li Yuan-Dong and Wang Na-Na</i>
Capillary Self-Assembly Based Multichip-to-Wafer System Integration Technologies.....	<i>Takafumi Fukushima</i>
Design of an optimized self-sensing piezoelectric cantilever for micro-robotic applications..	<i>Louis Masson, Xinchang Liu and Yves Perriard</i>
Non-UV Patterning of Gelatin Methacryloyl Hydrogel by Optically-induced Electropolymerization .....	<i>Yuzhao Zhang, Haibo Yu, Pan Li, Wenguang Yang, Junhui Law, Lianqing Liu, Gwo-Bin Lee and Wen Jung Li</i>
Magnetic Guidewire Control without Tip-Angle Detection in Sharply Curved Blood Vessel	<i>Jayoung Kim, Phu Bao Nguyen, Byungjeon Kang, Eunpyo Choi, Chang-Sei Kim and Jong-Oh Park</i>
Design and Analysis of a Compound Constant-Force Mechanism for Compliant Gripper ..	<i>Xiaozhi Zhang and Qingsong Xu</i>
Movable Nanowire Laser On Silicon Photonic Crystal Using Atomic Force Microscopy ....	<i>Masato Takiguchi, Atsushi Yokoo, Danang Birowosuto and Masaya Notomi</i>
Autonomous Robotic Vehicle for Oil Spills cleaning with Nano Particles .....	<i>Mohanish Shah, Sakshi Kokil Shah and Mitesh Shah</i>
Micro-Dispensing of Graphene Oxide based Capacitive Tactile Sensor for Human Pressure-Pulse Detection .....	<i>Ka Wai Kong, Junhui Law, Meng Chen, Zan Suo, Boliang Jia, Vellaisamy A. L. Roy, Ho-Yin Chan and Wen J. Li</i>
Dynamic Modelling and Control of a Sphere-based Micro Robot with Adjustable Arms ...	<i>Alireza Esfandbod, Hossein Nejat Pishkenari and Ali Meghdari</i>
Multi-Scale 3D Printed Capillary Gripper .....	<i>Marco Cavaiani, Sam Dehaeck, Youen Vitry and Pierre Lambert</i>

Capillary Dipoles: Towards Thermocapillary Micromanipulation of Multiple Particles Floating at the Free Surface.....	<i>Ronald Terrazas, Adrien De Maeijer, Aude Bolopion, Michaël Gauthier, Michel Kinnaert and Pierre Lambert</i>
Assembly of cellular microstructures into lobule-like 3D microtissues based on microrobotic manipulation .....	<i>Juan Cui, Huaping Wang, Qing Shi, Jianing Li, Zhiqiang Zheng, Tao Sun, Qiang Huang and Toshio Fukuda</i>
Bioinspired Ionic Soft Actuator Based on Core-shell-structured Bacterial Cellulose Membrane .....	<i>Fan Wang, Minghui Nan, Chang-Sei Kim, Sunghoon Cho, Jong-Oh Park and Eunpyo Choi</i>
Sidewall imaging of microstructures with a tilted quartz tuning fork (QTF) force sensor ..	<i>Danish Hussain, Wen Yongbing and Xie Hui</i>
Automated SEM-Guided AFM Scan with Dynamically Varied Scan Speed .....	<i>Jun Chen, Ji Ge, Brandon K. Chen, Zheng Gong, Chao Zhou, Chaoyang Shi, Shanghai Ru, Huayan Pu, Yan Peng, Shaorong Xie and Yu Sun</i>
A flexure-based 2-DOF microgripper for handling micro-objects .....	<i>Tilok Kumar Das, Bijan Shirinzadeh, Mohammadali Ghafarian and Joshua Pinskyer</i>
Synthesis and Surface-Enhanced Raman Scattering Properties of Au@Ag Core-Shell Nanoellipsoids .....	<i>Yanting Liu and Yajing Shen</i>
Chemically Self-propelled 3D-printed microbots .....	<i>Dengfeng Li, Yanting Liu, Yuanyuan Yang and Yajing Shen</i>
Arbitrary Placement of AFM Cantilever Higher Eigenmodes Using Structural Optimization.....	<i>Steven Moore, Michael Ruppert and Yuen Kuan Yong</i>
Micro droplets generation in a flowing continuous liquid using an ultrasonic transducer ...	<i>Nozomu Fujimoto, Murakami Takuji, Kota Mori, Tomoyasu Yamada, Takefumi Kanda and Koichi Suzumori</i>
Fast and Accurate Thickness Mapping of Liquid Bubbles and Thin Protein Films .....	<i>Zhe Wang, Biagio Mandracchia, Wei Chen, Vincenzo Ferraro, Ernesto Di Maio, Pier Luca Maffettone, Eliot Fried and Pietro Ferraro</i>
Rolling and Sliding of Spheres Inside Horizontal Channels .....	<i>Ebru Demir and Serhat Yeşilyurt</i>
Manipulation of Non-Magnetic Microbeads using Soft Microrobotic Sperm.....	<i>Ahmed Ezz, Anke Klingner, Ahmet Fatih Tabak and Islam Khalil</i>
Miniature robot with actuators based on Cu-Al-Ni shape memory single crystals.....	<i>Andrew Chikiryaka, Sergey Pulnev, Alexey Priadko and Vladimir Nikolaev</i>

Design, Analysis and Fabrication of sAFAM, a 4 DoF Assembled Microrobot .....	
<i>Ruoshi Zhang, Danming Wei and Dan Popa</i>	
Passive Steering of Miniature Walking Robot using the Non-Uniformity of Robot Structure .....	
<i>Jinhong Qu, Clark B. Teeple, Buyi Zhang and Kenn R. Oldham</i>	
Vibration Energy Harvesting from Multi-Directional Motion Sources .....	
<i>Thijs Blad, Davood Farhadi Macheckposhti, Just Herder, Andrew Holmes and Nima Tolou</i>	
Three dimensional microfabrication using local electrophoretic deposition assisted with laser trapping controlled by a spatial light modulator .....	
<i>Futoshi Iwata and Toshiki Matsuura</i>	
Some examples of path following in microrobotics .....	
<i>Bassem Dahroug, Ali Oulmas, Jean-Antoine Séon, Tiantian Xu, Brahim Tamadazte, Stéphane Régnier and Nicolas Andreff</i>	
SMC Difference of Normal and Cancerous Human Urothelial Cells Quantified with an Opto- Electrokinetic Device .....	
<i>Yanbin Lin, Na Liu, Yang Yang, Shaorong Xie, Liang Dong, Yan Peng, Huayan Pu, Pei Yu Chiou, Wen J. Li and Yu Sun</i>	
Design of a novel piezoelectric stick-slip driving nanopositioning stage and power supply circuit .....	
<i>Sen Gu and Changhai Ru</i>	
Control of Head-Tilting Angle of the Diamagnetically Levitated Microrobot in Liquid Media .....	
<i>Ali Anil Demircali, Cesur Atay Yilmaz and Huseyin Uvet</i>	
Mechanical bistable structures for microrobotics and mesorobotics. From microfabrication to additive manufacturing .....	
<i>Yassine Haddab, Guillaume Aiche, Hussein Hussein, Mouna Ben Salem, Philippe Lutz, Lennart Rubbert and Pierre Renaud</i>	
Ferrofluid Levitated Micro/Milli-Robots .....	
<i>Allen Hsu, Annjoe Wong-Foy and Ron Pelrine</i>	
Evaluation of motion reliability for robot manipulator .....	
<i>Yanjiang Huang, Changshu Wang, Huaiyan Tang, Yanfeng Shi, Ling Xiong, Lixin Yang, Zhenya He and Xianmin Zhang</i>	
Design and Analysis of Bistable Dielectric Elastomer Actuator with Buckling Beam .....	
<i>Nianfeng Wang, Chaoyu Cui, Bicheng Chen and Xianmin Zhang</i>	
Topology Optimization of Metamaterials for Energy Dissipation .....	
<i>Qi Chen, Xianmin Zhang, Benliang Zhu, Hongchuan Zhang, Rixing Wang, Yanfeng Shi and Ling Xiong</i>	

Topology Optimization of Compliant Mechanisms Using Moving Morphable Components with Flexure Hinge Characteristic .....	<i>Rixin Wang, Benliang Zhu, Xianmin Zhang, Hongchuan Zhang and Qi Chen</i>
A high-performance moving object detection method based on optical flow .....	<i>Xiang Zhang, Xianmin Zhang and Kai Li</i>
Topology optimization of flexure hinges with distributed stress for flexure-based mechanisms .....	<i>Min Liu, Jinqing Zhan, Benliang Zhu and Xianmin Zhang</i>
Multistability Analysis for the Compliant Four-fold Bricard Loops .....	<i>Hongchuan Zhang, Xiamin Zhang, Benliang Zhu, Rixin Wang and Qi Chen</i>
Improving acquisition time in Scanning Microwave Microscopy by undersampling the scan area .....	<i>Markus Franz Wieghaus, Olaf C. Haenssler and Sergej Fatikow</i>
Accurate 3D-Positioning in a SEM through Robot Calibration .....	<i>Valérian Guelpa, Andrey V. Kudryavtsev, Nadine Le-Fort Piat and Sounkalo Dembélé</i>
Micro-gripping methods for micro-spheres sorting .....	<i>Gianmauro Fontana, Serena Ruggeri, Giovanni Legnani and Irene Fassi</i>
A General Kinematic Modeling Framework for a 3D Compliant Micromechanism .....	<i>Zhong Yang and Dan Popa</i>
A Handheld Master Device for 3D Remote Micro-manipulation .....	<i>Sophia Sakr, Thomas Daunizeau, David Reversat, Stéphane Régnier and Sinan Haliyo</i>
Bidirectional, Thin-Film Repulsive-/Attractive-Force Electrostatic Actuators for a Crawling Milli-Robot .....	<i>Ethan W. Schaler, Loren Jiang, Caitlyn Lee and Ronald S. Fearing</i>
Dynamic Behavior of Running Insect Activated by High-Speed Microdroplets Manipulation .....	(video) <i>Belal Ahmad, Daiki Sato, Reo Takemoto, Hirofumi Ohtsuka, Idaku Ishii and Tomohiro Kawahara</i>
Current Reference Projection Method for Securing Micro-robot Control Bandwidth Under Voltage Limit Condition .....	<i>Jin-Su Hong and Jung-Ik Ha</i>
Tilted Leg Design for a Rapid-Prototyped Low-Voltage Piezoelectric Running Robot .....	<i>Ketul Patel, Jinhong Qu and Kenn Oldham</i>
Dielectrophoretic Microfluidic Device for Size-Based Separation of Microparticles: Feasibility Study .....	<i>Afraa Rahsed Al-Mehairi, Amber Childs-Santos, Ibeawuchi Anokam, Jelani Blue, Salini Ramesh, Ali Hilal-Alnaqbi, Fadi Alnaimat and Bobby Mathew</i>

Vibrational Analysis during Cell Injection in ICSI Operation .....	<i>Ferhat Sadak, Mozafar Saadat, Amir M. Hajiyavand and Georges Nomicos</i>
Design and kinematics of a compliant Stewart micromanipulator .....	<i>Suraj Kumar Mishra and C. S. Kumar</i>
Composite nanotools with shape memory effect for creation micro- and nanostructures based on quasi one-dimensional compounds with charge density wave.....	<i>Andrey Orlov, Peter Lega, Aleksei Frolov, Sergey Zybtshev, Vadim Pokrovskii and Victor Koledov</i>
Controlled Delivery of Signaling Molecules using Magnetic Microrobots.....	<i>Sambeeta Das, Elizabeth Hunter, Nicholas Delateur, Edward Steager, Ron Weiss and Vijay Kumar</i>
IPMC Kirigami: a Distributed Actuation Concept.....	<i>Andres Hunt, Mirte Freriks, Luigi Sasso, Peyman Mohajerin Esfahani and S. Hassan Hosseinnia</i>
A virtual feedback assistance system for remote operation of a 3DOF micromanipulator in Micro-Nanorobotic Manipulation .....	<i>Ujjal Dey, Supriti Sen, Meher Wan, Chacko Jacob and C S Kumar</i>
Design of High Stiffness Inertial Slider for In-Situ TEM .....	<i>Ajay Kumar Panda and M S Bobji</i>
Modeling and Experimental Characterization of an Active MEMS Based Force Sensor ....	<i>Jonathan Cailliez, Mokrane Boudaoud, Abdenbi Mohand Ousaid, Antoine Weill Duflos, Sinan Haliyo and Stéphane Régnier</i>
Quantitative Error Analysis in Near-Field Scanning Microwave Microscopy .....	<i>Kamel Haddadi, Petr Polovodov, Didier Théron and Gilles Dambrine</i>
3D Micromolding of Small-Scale Biological Robots .....	<i>Elizabeth Hunter, Evan Brink, Edward Steager and Vijay Kumar</i>
Hybrid Centralized/Decentralized Control of Bacteria-based Bio-hybrid Microrobots.....	<i>Eric Leaman, Brian Geuther and Bahareh Behkam</i>
Cell Tracking with Deep Learning and the Viterbi Algorithm.....	<i>David Hernandez, Steven Chen, Elizabeth Hunter, Edward Steager and Vijay Kumar</i>
Automated Robotic Stimulation of Freely Moving Drosophila Larvae .....	<i>Peng Pan, Juntian Qu, Weize Zhang, Xianke Dong and Xinyu Liu</i>
Vacuum-Driven Micropump with Support Columns: Toward Large Scale Single-cell RNA-sequencing .....	<i>Kento Hisa, Kakugawa Musashi, Takayuki Shibata and Moeto Nagai</i>
Design Optimization and Analysis of a Damped Flexure-guided Stage .....	<i>Zhong Chen, Xiaomeng Jiang and Xianmin Zhang</i>