

# **2025 IEEE 20th International Conference on Nano/Micro Engineered and Molecular Systems (NEMS 2025)**

**Zhuhai, China  
11-14 May 2025**



**IEEE Catalog Number: CFP25NME-POD  
ISBN: 979-8-3315-9913-3**

**Copyright © 2025 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:	CFP25NME-POD
ISBN (Print-On-Demand):	979-8-3315-9913-3
ISBN (Online):	979-8-3315-9912-6
ISSN:	2474-3747

**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

## MoA-1: Awards Session I

<a href="#">Integrating Machine Learning and Ion-Exchange Membrane Technology for Rapid Acute Myocardial Infarction Diagnosis Using miRNA Biomarkers</a>	N/A
<i>Xiang Ren, Ruyi Zhou, George Ronan, S. Gulberk Ozcebe, Jiaying Ji, Satyajyoti Senapati, Keith March, Eileen Handberg, David Anderson, Carl Pepine, Hsueh-Chia Chang, Fang Liu, Pinar Zorlutuna</i>	
<a href="#">High Endurance Flexible Humidity Sensor Based on Ammonia Composite Conductive Fibers for Moisture Detection</a>	7
<i>Xianruo Du, Chenqi Zheng, Zhenxing Chen, Wenxin Li, Ruixin Chen, Huatan Chen, Gaofeng Zheng</i>	
<a href="#">Neuromorphic Computing Based on AlN/HZO Ferroelectric Tunnel Junction</a>	12
<i>TSEUNG-YUEN TSENG, Xuan-Kai Tang, Stephen Ekaputra Limantoro, Chao-Cheng Lin, Wen-Yueh Jang</i>	
<a href="#">Deep Learning-Based Assessment of Non-Physiological Damage in Red Blood Cells through Morphological Characterization</a>	17
<i>Youyuan Xu, Enting Gao, Ying Li, Yichong Hu, Yue Yu, Hao Yang</i>	
<a href="#">Reversible Formation Control of Multiple Miniature Robots under Global Magnetic Stimuli in Confined Spaces</a>	22
<i>Siyu Guo, Shihao Zhong, Yaozhen Hou, Zhiqiang Zheng, Qing Shi, Qiang Huang, Huaping Wang</i>	
<a href="#">Design and Implementation of A Hybrid Robot for in Vivo Micromanipulation</a>	28
<i>Rongxin Liu, Bo Hu, Shiyu Xu, Xin Zhao, Mingzhu Sun</i>	

## MoB-1: Molecular Sensors, Actuators and Systems

<a href="#">Characterization of Atomic Motion in Alkali Metal Vapor Cells</a>	34
<i>Bowen Liu, Zihao Lyu, Xiangyang Zhou</i>	
<a href="#">Sputtered Pt/Pd bimetallic electrode on p-type silicon for room temperature ammonia sensing</a>	39
<i>Jiashu Gui, Feilong Mao, Hui Xu, Yijia Liu, Hui Zhang</i>	
<a href="#">Ion Gel-Based Temperature Sensing Film for Soft Tactile Sensors</a>	N/A
<i>Ruijia Zhang, Xiong YANG, Hao Ren, Dong Guo, Zhongrong LING, Yajing Shen</i>	
<a href="#">An Innovative Nanorobotic System for Low Concentration Protein Detection in In Vitro Fertilization</a>	N/A
<i>Yuxuan Xue, Ning Xi, Yichen Wang</i>	
<a href="#">Development of magnetically controlled Chlorella microrobots with autofluorescence properties</a>	45
<i>Yaoxian Guo</i>	

## MoC-1: Micro/Nano Electro-Mechanical Systems I

<a href="#">A MEMS piezoresistive 3D Force Sensor for Robotic Dexterous Hands</a>	49
<i>Junyan Li, Hangwei Zhang, Can Xu, Wenjun Huo, Aomen Li, Shuai Ma, Guyi Xu, Dongsheng Li, Huicong Liu</i>	
<a href="#">A Novel Structure of MEMS Alkali Vapor Cell with Intermediate Glass Layer for Atomic Sensors</a>	53
<i>Zihao Lyu, Bowen Liu, Jinguo Mu, Xiangyang Zhou</i>	
<a href="#">ADVANCED SELF-POWERED NIR PLASMONIC PHOTODETECTION AND PHOTOELECTRON SPECTROSCOPY</a>	N/A
<i>Eslam Abubakr, Shiro Saito, Hironori Suzuki, Tetsuo Kan</i>	
<a href="#">Bladder Therapy Using a Self-Integrated Implantable Cuff Electrode Neuromodulator</a>	58
<i>Zixuan Li, Pengyu Li, Yuanyi Wang, Xuemu Li, Yi Zheng, Zhengbao Yang</i>	
<a href="#">Bioinspired Magnetic Microrobotic Fish with Fins for Enhanced Locomotion Driven by A Mechano-Electromagnetic Hybrid Actuation System</a>	62
<i>Dongqin Xu, Yixin Liu, Dingtong Shen, Xiangpeng Li, Fuzhou Niu, Hao Yang</i>	
<a href="#">An ultra-stable MEMS oscillator based on high-Q micromechanical resonator and a two-stage temperature compensation system</a>	67
<i>Chun Wang, Yutao Xu, Gang Shao, Junsheng Lv, Xueyong Wei</i>	

## MoA-2: Awards Session II

Theoretical model and optimal design of aluminum nitride pyroelectric detector with integrated spectrally selective metamaterials <i>congchun zhang, anjie ming, yongmin zhao, xiaobo dan, feng wei, changhui mao</i>	73
Modulating Resonance Mode Sequencing in Nanomechanical Resonators <i>Luming Wang, Jiaqi Wu, Jiankai Zhu, Zenghui Wang</i>	78
Controllable acoustofluidic rotation and three-dimensional reconstruction of single cells <i>Langxuan Li, Bangyan Zhu, Chenhao Bai, Zhuo Chen, Yunsheng Li, Fengyu Liu, Qiang Huang, Tatsuo Arai, Xiaoming Liu</i>	82
Trajectory Optimization and Tracking Control for a New Scanning Method of Atomic Force Microscopy <i>Yanding Qin, Haitao Wu, Xiaolong Jia, Jianda Han</i>	88
Dual-Gate Silicon Nanowires Sensor for Label-Free EGFR Protein Detection Based on Capacitive Coupling Operation and Maximum Threshold Voltage Response Calibration <i>Yazhao Li, Yanzhi Dou, Tie Li</i>	94
A Magnetic Sensor based on a Coil Probe for Electromagnetic Non-Destructive Testing <i>Xinyu Dong, Pengfu Liang, peng li, Hecheng Liu, Xiucheng Liu</i>	99
Fabrication of SERS Chips by Laser Interference Induced in Liquid <i>zhankun weng, Yue Sun, Feiyue Zuo, Mengqi Sun, Huazhen Zhong, Tong Liu, Tao Li, Guanqun Wang, Shenzhi Wang, Xinming Zhang</i>	105

## MoB-2: Micro/Nano/Molecular In-situ Characterization and Fabrication

Correlation between Microstructure and Macroscopic Characteristics of Energy Materials <i>Kun Zheng</i>	N/A
In-situ environmental electron microscopy study of the initial oxidation of structural materials <i>Ang Li, Yanhui Chen, Wei Li, Lihua Wang, Shengcheng Mao, Xiaodong Han</i>	N/A
Intelligent Electron Microscope System Based on Artificial Intelligence and NEMS Chip <i>Ruiwen Shao</i>	N/A
Spatially Resolved Characterization of X-ray Absorption Grating Based on Angular X-ray Transmission <i>Runtao Deng, Yufeng Li, Jincheng Lu, Ruifeng Liu, Li Zhang, Zhentian Wang</i>	N/A
Microlens fabricated by TPP for elliptical spot modulation <i>Hongji Guo, Jianchen Zheng, Jingang Wang, Yuzhao Zhang, Tianming Zhao, Xiaoduo Wang, Haibo Yu</i>	N/A

## MoC-2: Micro/Nano Electro-Mechanical Systems II

Bio-inspired hybrid 2-axis flow and pressure sensor integration for enhanced spatial recognition in Autonomous Underwater Vehicles <i>Himasha Ekanayake, Yomal Randeniya, Anjana Marasinghe, Dumith Jayathilake, Ranjith Amarasinghe</i>	111
Scandium-doped polycrystalline aluminum nitride thin film pyroelectric detector with candle soot-Au nano absorption layer <i>dan dan</i>	116
A Stretchable 3D Force Sensor with High Stability for Robotic Dexterous Hands <i>Wenjun Huo, Lei Yu, Yuyang Sun, Junyan Li, Huicong Liu, Dongsheng Li</i>	120
Optimization of Disk Resonator Gyroscope for Enhancing Quality Factor by Reducing Heat Flux <i>Cui Tianfei, Deng Yuting, Li Taobo, Li Heng, Xie Jianbing</i>	N/A
Gyroscope Structural Optimization Based on NSGA- II for Sensitivity Improvement Considering Frequency Split <i>Deng Yuting, Cui Tianfei, Li Taobo, Li Heng, Xie Jianbing</i>	128
Designing and Evaluating a Wearable Pulse Palpation Sensor for Improved Pulse Diagnosis in Traditional Chinese Medicine <i>Senlin Hou, Xiaotong Chen, Jiangang Shen, Wen Jung Li</i>	N/A

## MoPo-1: Poster Session I

Quantitative Measurement of Fibrinogen Concentration by a Spotting Test on a Paper Microfluidic Device <i>Xionghui Li, Haonan Li, Xuanying Liang, Zitao Feng, Zejingqiu Chen, Muyang Zhang, Jie Zhou, Qinghao He, Huiru Zhang, Lok Ting Chu, Weijin Guo</i>	132
High-Performance Flexible Microneedle Dry Electrode Array for High-Density Electroencephalogram (HD-EEG) Recording <i>Junshi Li, Zhongyan Wang, Jiayan Zhang, Yu-Qing Zheng, Zhihong Li</i>	136
Single-Cell Level Biophysical Analysis of Circulating Tumor Cells <i>Jiaming Chen, Mengkun Chen, Asra Samouan Miandoab, Kewei Liu, Inyoung Kim, Yuxiang Qin, Xiuyun Liu, Miao Yu, Xiang Ren</i>	140
3.54-million Q-factor Micro Hemispherical Resonator Gyroscope with Segmented Displacement Startup <i>Zhaorong Ke, Yi Zhou, Peng Sun, Xi Wang, Tong Zhou, Yan Su</i>	146
A Calorimetric Differential Pressure Sensor for Underwater Flow Sensing <i>Yudong Cao, Tianyu Sheng, Zheng Gong, Deyuan Zhang, Jun Cai, Yonggang Jiang</i>	151
Content-based Compressive Sensing for AFM Nanorobot <i>Jianfeng Lin, Yuxuan Xue, Yichen Wang, Wenjun Tan, Xinyu Liu, Ning Xi</i>	155
Solution-processed low-toxic CuZnInSSe colloidal quantum dots photodiodes and image sensors <i>Tong Chen, Qiang Lou, Aisling Stewart, Wenlong Ming, Bo Hou, Hang Zhou</i>	159
Micro-Area Excitation and Collection Optical System Based on Surface Plasmon Polaritons Array <i>Zuwei Wu, Wenzhuo Zhang</i>	165
Designing Multilayered Structural Colors Using Low-Cost Dielectric Materials <i>Anya Li, Jungtaek Kim, Mingxuan Li, Paul Leu</i>	169
NIR and MIR tunable Fabry-Perot filter based Dual Band Mirror <i>Beichen Zhou, Yupeng Yan, Min Wang</i>	N/A
Precise replication of the intestinal villi structure using digital light processing (DLP) stereolithography technology <i>Tianming Zhao, Meihan Liu, Bo Wang, Hongji Guo, Haibo Yu</i>	N/A
Fabrication of Micro-Structure for Self-Adhesive Surfaces <i>Wenjun Tan, Yuxuan Xue, Yichen Wang, Liang Ma, Jianfeng Lin, Ning Xi</i>	N/A
Minimizing Warpage of PDMS Mold by Use of a Silicon Backplate in Micro-Molding Process <i>Zhongyan Wang, Jingkai Tang, Zhe Huang, Zhihong Li</i>	175
Fast Phase Error Identification of MEMS Gyroscope based on Sinusoidal Quadrature Disturbance and FFRLS Algorithm <i>Yi Zhou, Zhaorong Ke, Shenhu Huang, Zhenjun Wang, Tong Zhou, Bo Jiang, Yan Su</i>	180
Influence of AlN-interlayer and growth parameters of Mo electrode on AlN piezoelectric thin films for FBAR <i>Shaocheng Wu, Jiazhe Zhang, Yuhang Dou, Rongbin Xu, Daquan Yu</i>	185
A High-Performance Flexible Strain Sensor for Smart Glove in Human-Machine Interaction <i>Lei Yu, Wenjun Huo, Yuyang Sun, Tianci Ji, Aomen Li, Huicong Liu, Dongsheng Li</i>	189
A High-Mass MEMS Gyroscope with Enhanced Large Capacitance and Area-Variable Comb Electrodes <i>ShenHu Huang, Yi Zhou, Bo Jiang, Meng Liu, Yixuan Li, Yan Su</i>	193
A Parametric Fitting Method for Parasitic Capacitance in MEMS Resonators <i>Meng Liu, ShenHu Huang, Yi Zhou, XinYuan Wang, Jiang Bo, Yan Su</i>	197
Coaxial Single Optical Path System Design Based on MEMS LiDAR <i>Zenghui Hao, Xiang Guo, Ji Chen, Tianxiang Liang, Cao Xia, Zhuqing Wang, Yuanlin Xia</i>	N/A
A NOVEL MEMS PRESSURE SENSOR WITH RESIDUAL STRESS COMPENSATION FOR MICRO-PRESSURE RANGE <i>Xiaolong Ru, Chunyang Li, Zhengyang He, Cao Xia, Yuanlin Xia, Zhuqing Wang</i>	204
Study on High-resolution Rapid Eye Tracking Method Based on Electrostatic MEMS Mirror <i>Tianxiang Liang, Haoyu Tan, Zenghui Hao, Cao Xia, Zhuqing Wang, Yuanlin Xia</i>	N/A

New Fabrication Method of a Miniature Calorimetric Biosensor with Unique Suspended Freestanding Channel for Small Volume Enzymatic Reaction Detection <i>Siyuan Quan, Zhuqing Wang, Jingru Liao, Shu Huang, Cao Xia, Yuanlin Xia</i>	210
High Sensitivity MoS <sub>2</sub> Nano-electromechanical Film Resonant Drum Pressure Sensor Based on Frequency Combs Mechanism <i>Jiajia Xiang, Zhuji Zhao, Jiaxing Miu, Yuanling Xia, Zhuqing Wang, Cao Xia</i>	N/A
Design and fabrication of a high-sensitivity MEMS Pirani vacuum sensor with three-mode switching <i>Jingping Qiao, Yanmei Kong, Ruiwen Liu, Binbin Jiao, Shichang Yun, YuXin Ye, Xiangbin Du, Zilong Wang, Sibo Li, Guoran Lu, Xinhao Meng, Ruihai Su</i>	214
Numerical Simulation Research on the Energy Conversion Law of Ni-Cr Bridge Film Transducer Elements <i>Hengzhen Feng, Yichen Chai, Wenzhong Lou, Sining Lv, Jinkui Wang</i>	218
Simulation Study on Flameproof Performance of Flyer-type Micro Explosive Train's Explosion-proof Component <i>Wenzhong Lou, Lu Wang, Bo He, Peilin Yao, Sining Lv, Hengzhen Feng</i>	224
Preparation of (001)-Oriented Titanium-Rich PZT Films via LaNiO <sub>3</sub> Seed Layer and Development of Pyroelectric Infrared Detectors <i>anjie ming, yongmin zhao, guangteng ci, congchun zhang, xiaobo dan, feng wei, changhui mao</i>	230
MEMS Thermal Actuator for Thermal Logic Gates Based on UV-LIGA Process <i>Jiaxiang Wang, Zhiyuan Hu, Fengming Ye, Tie Li, Xiaojun Guo, Zhuoqing Yang</i>	236

## TuB-1: Nanomaterials Based Devices and Systems I

Fully Printed and Sweat-Activated Micro-Batteries with Lattice-Match Zn/MoS <sub>2</sub> Anode for Long-Duration Wearables <i>Xinyi Zhang, Linyu Hu, Kemeng Zhou, Linqing Zhang, Xiaolong Zeng, Yuqing Shi, Weizheng Cai, Jiazhen Wu, Yuanjing Lin</i>	N/A
Flexible Human-Machine Interacting Sensors <i>Yanchao Mao</i>	N/A
Privacy-Preserving Infrared Thermal Imaging Sensing and Recognition Platform for Elderly Care <i>Feng Jin, Yuxuan Dong, Yufei Zhai, Min Wang</i>	N/A
Epidermal Secretion-purified Biosensing Patch with Hydrogel Sebum Filtering Membrane and Unidirectional Flow Microfluidic Channels <i>Yuqi Wang, Ziyu Zhang, Yuqing Shi, Xiong Yu, Xinyi Zhang, Xiaohao Ma, Junjie Su, Ruochen Ding, Yuanjing Lin</i>	N/A
Local optical structure regulation for upconversion luminescence based near-infrared detector <i>Jianqing Cai, Yunheng Wang, Yufei Zhai, Min Wang</i>	N/A
PEDOT:PSS Hydrogel-Based Microelectrode Arrays Fabricated by DLP Digital Light Processing Technology <i>Bo Wang, Meihan Liu, Hongji Guo, Tianming Zhao, Haibo Yu</i>	242

## TuC-1: Micro/Nano Fluidics

Vertically Asymmetrical Microstructures for Enhanced Thin-film Evaporation Cooling <i>Li Jiang, Weinan Ran, Di Wu, Faheng Zang</i>	246
Bimodal Fusion of Single-cell Impedance and Imaging Data Using Three Deep Neural Networks of Data-level Direct Modeling, Feature-level Joint Fusion and Decision-level Meta-learning, a Comparative Study <i>Songjiang Chen, Xiao Chen, Xukun Huang, Zhen Fang, Junbo Wang, Xiaoye Huo, Xianxiang Chen, Jian Chen</i>	250
Data Processing of Single-Cell Impedance Profiles Using Three Deep Neural Networks of Feature-level Joint/Marginal Fusions and Decision-level Meta-learning, A Comparative Study <i>Xinyue Du, Xiao Chen, Huiwen Tan, Zhen Fang, Junbo Wang, Xiaoye Huo, Xianxiang Chen, Jian Chen</i>	254
Robotic Micromanipulation of Highly Deformable Irregular <i>C. elegans</i> Utilizing Contactless Orientation Control <i>Pengsong Zhang, Peng Pan, Zhen Qin, Hang Liu, Yu Sun, Xinyu Liu</i>	N/A

Circulating Tumor Cells Isolation by a Novel Hybrid Dielectrophoresis-Spiral Microchannel <i>Chun Yang, Zi-ang Zhou, Jiaming Chen, Asra Samouan Miandoab, Mohd Ridzuan Ahmad, Kewei Liu, Yuxiang Qin, Xiuyun Liu, Miao Yu, Xiang Ren</i>	259
Self-Powered Energy Micro-weather Station Based on Droplet-Based Electricity Generator <i>Guangxia Liu, Jingsheng Cui, Shanghao Gu, Fei Wang</i>	265

## TuB-2: Nanomaterials Based Devices and Systems II

Smart Microsystems for Thrombus Management <i>Xin Song</i>	N/A
Soft and Stretchable Crochet-Based Sensor for Real-Time Sign Language Translation <i>Keer Wang, SENLIN HOU, Wen Jung Li</i>	N/A
Nonlinear Dynamic Characterization of Few-Layer MoSe <sub>2</sub> <i>Shuang Cai, Wang Yalan, Bo Xu, Jiankai Zhu, Juan Xia, Zenghui Wang</i>	N/A
Swellable Metal Organic Frameworks and Ti <sub>3</sub> C <sub>2</sub> MXene Based Photo- Humidity Dual Responsive Soft Actuators <i>Ming Yang, Zongze Li, Haojun Chen, Jian Hu, Zhen Zhan, Chengzhi Hu</i>	272
A Flexible and Highly Sensitive Aerogel Sensor for Muscle Activity Monitoring and Intent Detection <i>Hongyu Zhang, Wen Jung Li</i>	N/A
Advancing Plantar Pressure Monitoring: A CNT-PDMS Sensor Array with Surface Microstructures <i>Xiaomeng Yang, Jiankun Li, Yu Feng, Hui Sun, Meng Chen, Guanglie Zhang, Wen Jung Li</i>	N/A

## TuC-2: Micro/Nano Electro-Mechanical Systems III

Study on Characteristics of Microparticle Concentration Distribution in Dust Explosion <i>Yizhe Wu, Wenzhong Lou, Weikun Xuan, Zhengqian Zhang, Hengzhen Feng</i>	278
Energy Glass (E-Glass): an Artificial Photosynthesis System for Solar Energy Harvesting and Organic Products Synthesis <i>Zi-ang Zhou, Xinyu Sun, Jiaming Chen, Chun Yang, Kewei Liu, Mohd Ridzuan Ahmad, Yuxiang Qin, Wei Yang, Miao Yu, Xiang Ren</i>	282
Three-in-One Chip Designed for Wide Range Vacuum Sensing <i>Jingping Qiao, Ruiwen Liu, Yanmei Kong, Binbin Jiao, Zhanqiang Hou, Feng Han, Shichang Yun, YuXin Ye, Xiangbin Du, Zilong Wang, Sibao Li</i>	288
Deep Forest-Based Automatic Feature Extraction for Human Activity Recognition with Wearable Sensors <i>Yehui Liu, Yu Feng, Jiankun Li, Hui Sun, Meng Chen, Guanglie Zhang, Wen Jung Li</i>	N/A
The Study of a SOI Pressure Sensor with High Conductivity for Leadless Package <i>Le Hao, Cun Li, Ran Zhang, Chuanjie Qin, Yulong Zhao</i>	292
Effects of pH and Current Density on the Performance of Ni/Co Alloy Micro Electrodeposition <i>Junchang Ji, Junlong Huang, Yuxiang Xiong, Fei Wang</i>	297
Machine Learning Enabled Wearable Sensors for Accurate Swimming Performance Analysis <i>Xiaodong Yu, Meng Chen, Guanglie Zhang, Wen Jung Li</i>	N/A

## TuPo-1: Poster Session II

Plant-Cells-on-Chip (PCOC): Bioelectrical Characteristics of the Plant Cells Embedded on Chip <i>Jiayu Li, Zi-ang Zhou, Wenlin Ren, Kewei Liu, Yuxiang Qin, Xiuyun Liu, Miao Yu, Xiang Ren</i>	303
Pressure detectors based on conductive and self-healing shape memory materials <i>Yangzhi YU, Yanan Zhang, Cao Xia, Zhuqing Wang, Yuanlin Xia</i>	N/A
Study on High-accuracy Mass Sensing Mechanism Utilizing Mode Localization Island Resonators <i>Maogang Li, Chunyang Li, Zhishun Huang, Jiarui Wang, Yuanlin Xia, Zhuqing Wang, Xiaoyu Liu, Cao Xia</i>	308
Design and manufacture of high precision data acquisition system of piezoresistive sensor array <i>Wenzhuo Zhang, Zuwei Wu</i>	313
Design and Fabrication of Honeycomb-Structured Surface Enhanced Raman Scattering (SERS) Substrate for DNA Detection <i>Ran Peng, Tingting Zhang, Ya Chen, Xinyu Liu</i>	318

Gold Nanoparticles Enhance Sensing Response of UV-Activated Zinc Oxide Nanoflowers-Based Chemiresistive Sensor <i>Siwaporn Khemphet, Tanakorn Osotchan, Rawat Jaisutti</i>	N/A
Enhancement of Polydiacetylene-Based Ammonia Sensors Using Silver Nanoparticles-Decorated Zinc Oxide Nanopellets <i>Pornchanan Chanchot, Siwaporn Khemphet, Tanakorn Osotchan, Rawat Jaisutti</i>	N/A
Simple and Low-cost Synthesis of Carbon Quantum Dots from Corn Husks <i>Thitima Jianpinitnun, Thanakit Weraphattana, Sasipon Terayawan, Porpin Pungetmongkol</i>	326
High-Precision Determination of Complex Refractive Indices in Ultrathin ReSe <sub>2</sub> Towards Enhanced Optomechanical Transduction Efficiency <i>ZiLuo Su, Luming Wang, Jiankai Zhu, Zenghui Wang</i>	N/A
High-Throughput In Vitro Expression and Morphological Characterization of Silk Nanofibrils <i>Yuchen Cui, Ruoxuan Peng, Xiao Zheng, Yifan Liu</i>	330
A microfluidic cell printer for bio-fabrication <i>Panzhe Xiao, Weiliang Zhi, Yifan Liu</i>	335
Fluorescent-coded droplet-based platform for high-throughput profiling of gastric cancer biomarkers <i>wenjie zhu, Huixian Lin, Chunchen Liu, Yifan Liu</i>	340
Fast Capillary Flow of Whole Blood Treated with Magnetic Field <i>Zitong Ye, Xionghui Li, Haonan Li, Muyang Zhang, Qinghao He, Jie Zhou, Hao Chen, Jiahua Zhong, Huiru Zhang, Lok Ting Chu, Weijin Guo</i>	345
Fast Lateral Imbibition on a Wood Ear-like Substrate by Patterning Cellulose on OSTE Microneedle Array <i>Qinghao He, Jiahua Zhong, Haonan Li, Zitong Ye, Muyang Zhang, Jie Zhou, Hao Chen, Huiru Zhang, Lok Ting Chu, Weijin Guo</i>	349
Coupled Surface Acoustic Wave Device-Based Concentration Sensor <i>Anjam Waheed, Tsunemasa Saiki, Kenji Sakamoto, Satoshi Amaya, Yuichi Utsumi, Michio Shimomura, Fumizaku Mizutani, Tadao Matsunaga, Sang-Seok Lee</i>	353
A Nano Radio Frequency Band-pass Filter Based On Internal Resonance With A Two-dimensional Resonator <i>Jiahao Lang, Jijia Xiang, Zhujie Zhao, Yuanlin Xia, Zhuqing Wang, Xiaoyu Liu, Cao Xia</i>	357
The Miniaturization Design and Output Performance Research of EEL Transducer Modules <i>Jianming Zhang, Wenzhong Lou, Wenxing Kan, Dongjie Liao, Hengzhen Feng</i>	361
Research on the Suppression Method of Charge Accumulation Effect in Micro-Hemisphere Gyroscope Based on Polarization Voltage Modulation <i>Ruihao Zhu, Mingze Gao, Sheng Yu, Jiangkun Sun, Yongmeng Zhang, Dingbang Xiao, Xuezhong Wu</i>	366
Research on an Intelligent Rotational Speed Sensing System for Fire Extinguishing Projectiles Based on Geomagnetic Information <i>Feng Hengzhen Feng, L Y, Lou Wenzhong Lou, Kan Wenxing Kan, Ren Jie Ren</i>	371
High-Performance and Surface-Micromachined CMOS-MEMS Flow Sensor with Lithography-Free Post-CMOS Process <i>Xiangyu Song, Linze Hong, Ruining Xu, Jiahong Huang, Yubin Ma, Wei Xu</i>	377
Angular Resolution Modulation Method Based On Central Angle Estimation And Modulated Rectangular Area <i>Xun An, Qiang Shen, Zhuqing Wang, Cao Xia, Yuanlin Xia</i>	N/A
Design and Optimization of High-Frequency, Large-Angle PZT Piezoelectric MEMS Micromirror <i>Haoxiang Li, Yu Huijun, Wenjiang Shen</i>	381
Large-size electromagnetic MEMS micromirrors based on soft magnetic films <i>Wanna Zhang, Wenjiang Shen</i>	386
Electromagnetically-driven MEMS Fast Steering Mirror for Inter-Satellite Laser Communication <i>Jiapeng Hou, Huijun Yu, Xiaoxia Wu, Wenjiang Shen</i>	391
Flexible and Transparent Conductive Meshes with Localized Cracks for Highly Sensitive Straining Sensing in Transparent Components <i>Linjie Liu, Bing Wang, Sheng Li, Shougang Gong, Xiaoliang Chen</i>	396

<a href="#">The Sensing and Power Management Strategy of Triboelectric Nanogenerator for Performance Optimization</a>	400
<i>Yirui Zhu, Jun Li, Liqiang Liu, Han Wu, Xucong Chen, Wei Ou-Yang</i>	
<a href="#">Thin film thermocouple on porous structure substrate and iterative optimization calibration method</a>	N/A
<i>Xu Fan, Bian Tian, Meng Shi, Zhongkai Zhang, Mingzhou He, Kewen Zhao, Guoliang Zhou, Jiaming Lei, Meng Wang, Shuimin Li, Zhaojun Liu, Qijing Lin, Zhuangde Jiang</i>	
<b>WeA-1: Nanoscale Robotics, Assembly, and Automation</b>	
<a href="#">Fabrication of Micro/Nano Energy Devices and Their Application in Self-Driven Micro/Nano Robots</a>	N/A
<i>kuan Chen, Yue Xia, Meng Wang, JIAN YANG</i>	
<a href="#">Small-scale robots: Miniature but capable robots to revolutionize healthcare</a>	N/A
<i>Jiacheng Zhang</i>	
<a href="#">A Fast Local Imaging Method for Magnetic Microrobot Planar Spin Velocity Measurement</a>	408
<i>Zhiyong Sun, Yu Cheng, Gengliang Chen, Hong Lei, Song Bo</i>	
<a href="#">SEM-based Electrostatic Field-assisted Probe Nanomanipulation of Ag Nano-solders</a>	N/A
<i>Yanchao Guan, Ye Ding, Aoyun Jin, Hui Xie, Lijun Yang</i>	
<b>WeB-1: Nanomaterials Based Devices and Systems III</b>	
<a href="#">Superstable microbubble-based robots for wireless and precise control</a>	N/A
<i>Wenbin Kang, Fan Wang</i>	
<a href="#">Skin-Inspired High-Performance Flexible Electronic Devices based on 2D materials for Multimodal User-Interaction</a>	N/A
<i>Jing Zhao</i>	
<a href="#">A Dual-Response Mechanoluminescent Flexible Sensor for Enhanced Spatial Resolution and Visualized Sensing Applications</a>	N/A
<i>Qiaojiao Wang, Yu Feng, Hongyu Zhang, Wen Jung Li</i>	
<a href="#">Development of a Stretchable, Bioadhesive Dual-Network Hydrogel for Bioelectronic Interfaces</a>	415
<i>Aiyi Ning, Xize Gao, Ziyi Wang, Qin Li, Mingjun Zhang</i>	
<a href="#">A heart-on-a-chip with CNTs microsensors for 3D cardiomyocyte microtissue beating monitoring</a>	N/A
<i>Qingzhen Yang, Yixuan Li</i>	
<b>WeC-1: Micro/Nano Electro-Mechanical Systems IV</b>	
<a href="#">Sub-millimeter Bioelectronic Microsystems Based on the Physical Integration of Modular Devices</a>	N/A
<i>Chaojian Hou, Mingxing Cheng, Kun Wang, Shuideng Wang, Luoqi Cai, Lixin Dong</i>	
<a href="#">An Ultrasonic Resolving Approach for Gas-liquid Two Phase Flow in Microchannel based on PINN Rectification</a>	419
<i>Yizhe Wu, Wenzhong Lou, Weikun Xuan, Hengzhen Feng</i>	
<a href="#">Minimally Invasive Measurement of Sucrose Content in Plant Phloem Using Ultra-Fine Flow Path Needles</a>	423
<i>yang ye, Noriko Tsuruoka, Tsubo Mitsuru, Eiji Nishihara, Koutoku Ohmi, Sang-soek Lee, Tadao Matsunaga</i>	
<a href="#">Research on High-Precision Embryo Electroactivation Chip Based on Electric Field Optimization and Calcium Oscillation Regulation</a>	427
<i>Yuanzhi Yang, Haizhen Sun, Xiang Fan, Yichen Zhu, Haibo Huang</i>	
<a href="#">Micromanipulation Robot for Blood Viscoelasticity Testing</a>	433
<i>Shuibin Chen, Xie Chen, Kaohao Wen, Rui Tang, Qing Shi, Toshio Fukuda, Tao Sun</i>	
<a href="#">Few-layer MoSe<sub>2</sub> nanomechanical resonator with a high power-to-frequency responsivity at room temperature</a>	N/A
<i>Wang Yalan, Shuang Cai, Xu Bo, Jiankai Zhu, Xia Juan, Zenghui Wang</i>	
<b>WePo-1: Poster Session III</b>	
<a href="#">Pose Estimation of Micro Component Based on 3D Gaussian Splatting</a>	441
<i>Wenlong MA, Wenzhong LOU, Chenglong Li, Lin Wang, Nanxi Din</i>	

Adaptive Trajectory Tracking Control for Dual-Axis Rotary Piezoelectric Micro/Nano Manipulator Based on RBF Neural Network Sliding Mode Control <i>Jiakang Jiang, Siyuan Meng, Shiyu Ma, Qian Ju, Junhui Zhu, Changhai Ru</i>	446
Video-rate atomic force microscopy (AFM) imaging for observing dynamic processes using compressed sensing <i>Yichen Wang, Yuxuan Xue, Wenjun Tan, Xiao Luo, Liang Ma, Ning Xi</i>	N/A
Operando Investigation of Li <sup>+</sup> Ion Transport in h-BN Interlayers <i>Wenqi ZHANG, Ran CAI, Zhi Qu, Yiqing YAO, Ruiwen SHAO, Fei CHEN, Lixin Dong</i>	N/A
Cellular Stiffness Influences Collective Keratinocyte Migration Under Normal and High Glucose Conditions <i>Yin Li, Min Long, Yongliang Yang</i>	N/A
Application of Wearable and Implantable Triboelectric Nanogenerators in the Field of Health Monitoring <i>Rui Zhang, Jiexiang Liang</i>	N/A
Wearable Temperature Sensor Based on PEDOT:PSS/PEI-Doped MWCNTs Conductive Yarns <i>Kuntima Pattanarat, Nattasamon Petchsang, Rawat Jaisutti</i>	N/A
All-in-One Multifunctional Device Featuring Simultaneous Pressure Sensing and Power Supplying Capabilities <i>Yangyang Song, Yubo Huang, Cao Xia, Yuanlin Xia, Zhuqing Wang</i>	N/A
Bioinspired Tactile Sensation for Resolving Both Mechanical Intensity and Directional Features <i>Yiqun Zhang, Yubo Huang, Cao Xia, Yuanlin Xia, Zhuqing Wang</i>	N/A
Low resistance ohmic contact of Zn to the polycrystalline ni-trogen-doped p-type $\beta$ -Ga <sub>2</sub> O <sub>3</sub> film with post-annealing studies <i>Hangcheng Zhou, Xinping Wang, Weijun Chen, hongxia chen, Sufen Wei</i>	464
ELECTROSTATIC INTERACTION-DOMINATED BIO-TRIBOELECTRIC NANOGENERATOR FOR SELF-POWERED BREATH-ACTIVATED AMMONIA SENSORS <i>Fayang Wang, Pengfan Wu, Endian Cui, Yi Yang, Xiaojing Mu</i>	468
Dual-Function Detection Of Commercial Fabrics Based On Spirally-Layered Iontronic Fibrous Sensors <i>Siyuan Quan, Zhuqing Wang, Qi Liu, Yuanlin Xia, Cao Xia</i>	N/A
Design and analysis of RF MEMS capacitive switch based on photoresist sacrificial layer technology <i>Man Zhang</i>	472
A Dual-Laser Scanning System with Different Incidence Angles for Expanding the Horizontal Field of View <i>Peng Zhou, Wenjiang Shen, Dongmin Wu</i>	N/A
Improving the vibration mode of cantilever beam-based PMUT with post processing soft interconnecting strategy <i>Yan Wang, Peng Chen, Junning Zhang, Zihan Li, Hongbin Yu</i>	479
Flexible and highly sensitive strain sensor array with controlled metal cracks for detecting strain distribution on equipment surfaces <i>Shougang Gong, Sheng Li, Bing Wang, Linjie Liu, Xiaoliang Chen</i>	484
A wearable ultrasound sensing system for measuring hardness of soft tissues <i>Tongyi Xu, Guangshuai Bao, Xiaoyu Li, Bo Meng</i>	488
Fully Flexible Vibration Sensor based on Suspended Membrane with Metal Microcracks <i>Yezi Hui, Sheng Li, Xiaoliang Chen</i>	492
AI-Enhanced Flexible Tactile Sensors with Multidimensional Perception <i>Senyuan Zhang, Sheng Li, Xiaoliang Chen</i>	497
Thermal-actuation Piezoresistive-detection Micromechanical Resonators with Quality Factor Self-Amplification Effect in Vacuum Environment <i>Yang Chenhao, Li Haojie, Cheng Yuxuan, Teng Geer, Li Xiaoying, Chang Honglong, Zhang Hemin</i>	501
Array-type piezoelectric energy harvester power management method and self-powered sensing system <i>Chenxi Zhao, Pengfan Wu, Endian Cui, Fayang Wang, Xiaojing Mu</i>	506

<a href="#">A Lateral-field-excitation PMUT Based on LN single-crystal thin film</a>	510
<i>Xuefei Meng, Chenchen Sun, Tao Wang, Weiliang Ji, Zhanqiang Xing, Xinqiang Pan, Yao Shuai, Xiangyu Sun, Wanli Zhang</i>	
<a href="#">Laser-Tunable Gold Nanomechanical Resonators</a>	N/A
<i>Jiaqi Wu, Jiankai Zhu, Luming Wang, Zenghui Wang</i>	