

2024 IEEE International Conference on Cyborg and Bionic Systems (CBS 2024)

**Nagoya, Japan
20-22 November 2024**



**IEEE Catalog Number: CFP24K26-POD
ISBN: 979-8-3503-8804-6**

**Copyright © 2024 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:	CFP24K26-POD
ISBN (Print-On-Demand):	979-8-3503-8804-6
ISBN (Online):	979-8-3503-8803-9

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
Web: www.proceedings.com

TABLE OF CONTENTS

Evaluation of Permeability of Thermoresponsive Microgel Valves for Single-Cell Analysis Devices	1
<i>Akito Watanabe, Yoshiyuki Yokoyama, Takeshi Hayakawa</i>	
Cell Transfection Efficiency Improvement Via Applying Stimulation Based on the Electrically Induced Microbubbles	5
<i>Yibo Ma, Wenjing Huang, Yoko Yamanishi</i>	
Multi-Sorting of Large Particles Utilizing Microvortex Generation by High-Speed On-Chip Flow Control.....	9
<i>M. Saito, N. Kiyama, Y. Yamanishi, N. Kimura, S. S. Sugano, S. Sakuma</i>	
Investigation of Influence Factors of Embedded Droplet Printing for Generation of Cancer Cell Spheroids with Controllable Size	13
<i>Xueping Yu, Takeshi Hayakawa</i>	
Visualization of Exercise Intensity During Walking Using Walk-Training Robot Having Photoplethysmographic Sensor	17
<i>K. Mori, S. Moriyama, H. Maruyama</i>	
Game-Based Automated Neurotraining Platform for Bionic Prosthetic Placements.....	21
<i>Eliza Landa-Carpinteyro, E. Rafael Hernandez-Rios, Christian Peñaloza</i>	
Design and 3D Printing of Lower Limb Prosthetic Socket	27
<i>Sheng Li, Bin Xie, Ye Chen, Xinyu Wu, Guoxin Fang, Yan Zhang, Fei Gao</i>	
Experimental Evaluation of Simple Prosthetic Arm Usage for a Patient with Four-Limb Deficiency Walking on Powered Knee Prostheses.....	33
<i>Ken Endo, Ryusuke Morita, Naoki Uchida, Tetsuo Tawara</i>	
Underwater Glider Actuated by Bioinspired Soft Swim Bladder.....	39
<i>Junjie He, Yong Cao, Xuejing Liu, Yonghui Cao, Guang Pan</i>	
Placement Optimization for Humanoid Robot Manipulation Using a Task-Driven Planning Method.....	46
<i>Haozhou Liu, Yibei Ma, Xuechao Chen, Zhangguo Yu</i>	
Development and Evaluation of Biomimetic Assist Suits	52
<i>Kanta Omori, Shotaro Iguchi, Takeru Todaka, Toma Ono, Isao Abe, Takehito Kikuchi</i>	
Evaluation of a Dual Axial Ankle Supporter with Adjustable Assisting Direction Mechanism for Plantarflexion and Dorsiflexion.....	58
<i>Shotaro Iguchi, Toma Ono, Takehito Kikuchi</i>	
Consistency-Based Gait Generation for Terrain-Blind Bipedal Walking Via V-SLIP Model and Reinforcement Learning.....	64
<i>Sicheng Xie, Shengyu Lu, Jingyuan Li, Xuan Liu, Shilin Luo, Liang Gao</i>	
Mechanism Design and Performance Analysis of a Novel Truss-Shaped Deployable Manipulator	70
<i>Changqing Gao, Hanlin Wang, Junran Yu, Yongjie Zhao, Xuelin Du, Jixue Mo, Fei Liu</i>	
Development of a Microrobot Screening System Driven by Combined Magnetic Fields and Optoelectronic Tweezers	76
<i>Ming Du, Hanwen Zhang, Zhejian Feng, Shuai Xiao, Lining Wu, Chunyang Li, Zhongyi Li, Jing Zhao</i>	

Motion Analysis and Design of Bionic Swimming Robot.....	81
<i>Yuanshao Yang, Mingkai Xia, Naike Wu, Junhan Zhang</i>	
Fixed-Point Magnetothermal Effect in Symmetric Double-axis Gradient Field	89
<i>Shuyu Li, Chutian Wang, Zeyu Song, Zijin Zeng, Chan Li, Ao Wang, Chunyuan Gan, Yingjian Guo, Lin Feng</i>	
Fixation of Engineered Skeletal Muscle Fiber Using Magnetically Induced Mechanical Interlocking for Micro Mechanical Structures.....	94
<i>Zhaoyu Wang, Chihiro Akiyama, Taisuke Masuda, Fumihito Arai</i>	
Microfluidic Formation of Porous Micogels with Interior Spiral Canals for Mesenchymal Stem Cell Culture	98
<i>Zhen Zhan, Tanyong Wei, Zhan Yang, Chengzhi Hu</i>	
Segmentation of Continuous Stimulus Response Patterns in a Cultured Neuronal Network	104
<i>Kazuki Nitta, Suguru N. Kudoh</i>	
Contact Detection of Forceps for a Vitreoretinal Surgical Simulator Using Infrared Reflection Images of Forceps	111
<i>K. Noda, H. Maruyama</i>	
S-CycleGAN: Semantic Segmentation Enhanced CT-Ultrasound Image-to-Image Translation for Robotic Ultrasonography.....	115
<i>Yuhan Song, Nak Young Chong</i>	
RCM Constrained Task Space Trajectory Generation for Autonomous Robotic Surgeries.....	121
<i>G Andal Amirthavarshini, Asokan Thondiyath</i>	
Vision Servoing Endovascular Interventional Robot System: Design and Verification	126
<i>Cheng Wang, Jianjun Zhu, Xinhua Li, Shijia Chen, Zexin Chen, Yongyang Huang, Yanju Wu, Meixiao Zhan, Ligong Lu</i>	
A Hierarchical Framework for Collision Avoidance in Robot-Assisted Minimally Invasive Surgery	133
<i>Jacinto Colan, Ana Davila, Khusniddin Fozilov, Yasuhisa Hasegawa</i>	
Gait Cycle Detection by Markerless Tracking and Swing Phase Prediction of Paralyzed Leg for Neurostimulation Control.....	139
<i>Kako Okada, Masaru Takeuchi, Katsuhitro Tokutake, Hitoshi Hirata, Tadayoshi Aoyama, Yasuhisa Hasegawa</i>	
Simulation of Epileptic Seizure Suppression Through Extracellular Potassium Modulation.....	143
<i>Niccolò Calcini, Vitalii Kyzy, Renaud B. Jolivet</i>	
A Time-Sequence Decoding Network Based on Frequency Band Power Characteristics for Auditory Attention Decoding	148
<i>Huanqing Zhang, Jun Xie, Qing Tao, Zengle Ge, Yu Xiong, Min Li, Guanghua Xu</i>	
MMG-Based Real-time Wrist Tremor Detection for Exoskeleton Integration	154
<i>Annika Guez, Junwei Li, Yu Chen, Yifan Wang, Ravi Vaidyanathan</i>	
Myriapod Robot Locomotion Control Using Central Pattern Generator Based on Kuramoto Oscillator Model.....	160
<i>Ya-Tang Yang, Jhih-Ci Li, Feng-Yu Wang, Jheng-Lin Lin, Lai Jhih-Hao, Jyun-Wei Shih</i>	
Decomposition of 3D Joint Angle by Kinematic Modeling of Free Flight Pigeon Forelimb	165
<i>Yishi Shen, Shi Zhang, Weimin Huang, Chengrui Shang, Yiming Sun, Qing Shi</i>	

Learning to Turn: Deformation Control of a Novel Flexible Fishtail Actuated by Artificial Muscles	171
<i>Junwen Gu, Yukai Feng, Zhengxing Wu, Jian Wang, Junzhi Yu</i>	
Improvement of the Biomolecular Artificial Muscle in Mechanical Properties and Three-Dimensional Application	177
<i>Chao-Shin Hsu, Hinako Yoshimura, Yingzhe Wang, Takahiro Nitta, Yuichi Hiratsuka, Keisuke Morishima</i>	
Contactless Bioprinting Based on Acoustic Tweezer	182
<i>Yunsheng Li, Xiaoming Liu, Zhuo Chen, Xiaoqing Tang, Jiaqi Shan, Fengyu Liu, Qiang Huang, Tatsuo Arai</i>	
Towards Mathematical Modeling of Tissue-Engineered Skeletal Muscle Considering Contraction-Induced Stiffness Changes.....	186
<i>Yoshitake Akiyama, Mizuki Nakamura, Noriyasu Iwamoto, Ken Masuya</i>	
Automatic Stiffness Measurement of Small Objects Using an Integrated System of Simultaneous Multi-Scale Observation and Two-Directional Force Measurement	190
<i>Masaru Kojima, Ryo Yoshikawa, Yasushi Mae, Tatsuo Arai</i>	
On-Chip Automated Acoustofluidic Three-Dimensional Observation System for Oocytes.....	194
<i>Zhuo Chen, Xiaoming Liu, Xiaoqing Tang, Dan Liu, Masaru Kojima, Qiang Huang, Tatsuo Arai</i>	
Advancing Biohybrid Insect Robot (BIR) Locomotion Control Through Non-Invasive Mechanical Stimulation	200
<i>Chowdhury Mohammad Masum Refat, Mochammad Ariyanto, Kazuyoshi Hirao, Kotaro Yamamoto, Keisuke Morishima</i>	
Frog Cyborg that Exhibits Vertical Jumping by Snap-Through Buckling	207
<i>Keiryo Kasai, Kyo Mizukose, Go Kawahara, Masahiro Omura, Masahiro Shimizu</i>	
Thermoelectrically Induced Thermal Stimuli in Madagascar Hissing Cockroach	213
<i>Zheng Xiaofeng, Mochammad Ariyanto, C. M. Masum Refat, Keisuke Morishima</i>	
An Adaptive Filter for Surface EMG Measurement During FES	218
<i>Yue Liu, Hiroshi Yokoi, Masao Sugi, Yinlai Jiang</i>	
Wavy Whiskers in Phocid Seals Exhibit High Signal-To-Noise in Sensing Hydrodynamic Flows	223
<i>Xingwen Zheng, Amar M. Kamat, Ming Cao, Michael S. Triantafyllou, Ajay G. P. Kottapalli</i>	
Paper Shape Tracking System Using Point Cloud and Physical Model	229
<i>Sena Takahashi, Hiroto Arasaki, Akio Namiki</i>	
Transition of Peri-Personal Space by Making Robot Hands Transparent and Displaying Virtual Hands to Improve the Accuracy of Position Grasping	235
<i>Kento Yamamoto, Tadayoshi Aoyama, Yasuhisa Hasegawa</i>	
RNNPB-Based Shared Control for Maintaining Sense of Agency in Robotic Teleoperation	239
<i>Tomoya Morita, Simon Armleder, Hiroto Iino, Tadayoshi Aoyama, Gordon Cheng, Yasuhisa Hasegawa</i>	
Target Motion Estimation by Multi-Eye Vision Hand-Arm	243
<i>Koki Terakado, Koki Hibino, Cheng Ju, Akio Namiki</i>	

Development and Application of an Exercise-Promoting System for the Elderly with a Gait Indicator	249
<i>Chang-Wen Wang, Han Zhang, Keisuke Osawa, Kei Nakagawa, Eiichiro Tanaka</i>	
Wearable Fabric Actuator Inducing Shoulder Movements for Directional Guidance of Hand Movements	255
<i>Kenta Yokoe, Tadayoshi Aoyama, Yuki Funabora, Masaru Takeuchi, Yasuhisa Hasegawa</i>	
Investigation of Sensory Provision for Calf and Shin Using Fabric Actuator	259
<i>Shinichi Masaoka, Haru Fukatsu, Yuki Funabora, Shinji Doki</i>	
Verification of Mechanism How Fabric Actuator Evoke Pinched Tactile by Using Force Distribution Sensor.....	263
<i>Shinichi Masaoka, Yusei Sato, Yuki Funabora, Shinji Doki</i>	
Design and Analysis of a Human-Centric Shoulder Exoskeleton to Improve the Range of Motion	267
<i>Avinash S Pramod, Santhakumar Mohan, Asokan Thondiyath</i>	
Design and Strength Verification of a Compact VGFL for Sit-To-Stand Assistance Robot.....	273
<i>Yahiro Ito, Jayant Unde, Sojiro Sugiura, Taisei Urata, Yasuhisa Hasegawa</i>	
Myoelectric Prosthetic Hand with Adjustable Tightening Socket for Varied Residual Limb Shapes.....	279
<i>Yuki Inoue, Yuki Kuroda, Yoshiko Yabuki, Yusuke Yamanoi, Xu Yong, Xiaobei Jing, Hiroshi Yokoi</i>	

Author Index