2021 IEEE International Conference on Mechatronics and Automation (ICMA 2021)

Takamatsu, Japan 8 – 11 August 2021

Pages 1-732



IEEE Catalog Number: CFP ISBN: 978-

CFP21839-POD 978-1-6654-3119-4

Copyright © 2021 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:
 CFP21839-POD

 ISBN (Print-On-Demand):
 978-1-6654-3119-4

 ISBN (Online):
 978-1-6654-4101-8

ISSN: 2152-7431

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

MA1-P	Poster Session (Intelligent Mechatronics and Automation)	
	Field Crop Extraction Based on Machine Vision	1
	Yanjuan Wu, Jian Wang, Yunliang Wang, Yiwen Zhao, Sai Zhang	
	Selective Maintenance of the Multi-component System with Considering Stochastic	6
	Maintenance Quality	
	Hui Cao, Fuhai Duan	
	AUV Path Following Formation Control Based on Extended Kalman Filter	12
	Juan Li, Jiaqi Wang, Ruikun Yuan	
	Solvable Criteria and Sequential Solution Method for the General 6R Inverse	17
	Kinematics Problem	
	Justin Zhang, Winston Zhang, Michael Zhang	
	Development of a Manufacturing System for Gear Assembly Using Collaborative	22
	Robots	
	Guoyuan Li, Erlend Holseker, Arvin Khodabandeh, Isak Gamnes Sneltvedt, Erik	
	Bjørnøy, Houxiang Zhang	
	An Improved Coning Error Compensation Algorithm	28
	Mingshuai Cui, Jianhui Zeng	
	Quick Response Code Application for Virtual Model	33
	Chenfei Chen, Xiaofei Wang, Jutao Wang, Bin Li	
	Target Detection and Tracking of Ground Mobile Robot Based on Improved Single	38
	Shot Multibox Detector Network	
	Zhongli Ma, Jiadi Li, Lili Wu, Linshuai Zhang, Yi Kang, Yaohan Zeng	
	Design and Research of a 36000rpm Nitrogen Compressor	44
	Jiangang Zhu, Sheng Feng, Xiaobo Dai, Jian Zhou, Lie Yu	
	Analysis of Assembly Deformation of a Detachable High Speed Rotor Tie Rod	49
	Xiaobo Dai, Sheng Feng, Jiangang Zhu, Jiale Tian, Jian Zhou, Lie Yu	
	Additive Attention for CNN-based Classification	55
	Xuesheng Li, Qiwei Xu, Xinlei Chen, Chen Li	
	An Autonomous Behavior Switching Method for Indoor Mobile Service Robots	60
	Viran Tian, Xingrun An, Xiaoging Oiu, Xichen Xu, Sen Zhang	

Trajectory and Attitude Measurement of Skier based on MINS/UWB Integration for	65
Indoor Intelligent Skiing System	
Xiaodan Cong, Hongpeng Guo, Jinliang Ruan, Lianwu Guan, Yanbin Gao	
Based on Multi-Feature Information Attention Fusion for Multi-Modal Remote Sensing	71
Image Semantic Segmentation	
Chongyu Zhang	
Morphometric Analysis of Coronal Craniosynostosis Bones of Facial Cranium Based	77
on Discrete Cosine Transform	
Heng Nie, Shengmin Zhou, Bingjue Li	
Radar Target MTD 2D-CFAR Algorithm Based on Compressive Detection	83
Cong Liu, Yunqing Liu, Qi Li, Zikang Wei	
Recovery of Simulated Fuel Debris by Remote Control Robot for Decommissioning	89
<u>Work</u>	
Naoki Igo, Shota Yamaguchi, Noriyuki Kimura, Kazuma Ueda, Kazuma Kobayashi,	
Toyoaki Tomura, Toshifumi Satake, Satoshi Mitsui	
Vehicle Pose Estimation System Base on Pressure Sensor Array for Clamping	95
Parking Robot	
Juzhong Zhang, Yuyi Chu, Zhisen Wang, Tingfeng Ye, Liming Cai, Hongbo Yang	
Research on Path Planning of Mobile Robot Based on Improved Jump Point Search	101
<u>Algorithm</u>	
Yunliang Wang, Sai Zhang, Yanjuan Wu, Yiwen Zhao, Jian Wang	
Research on Active Disturbance Rejection Control Technology in LCL	107
Grid-Connected Inverter	
Xuesong Zhou, Jie Yin, Youjie Ma	
Research on Roundness Detection and Sorting of Oil Cooling Pipe Based on	113
Machine Vision	
Junjie Li, Chunguang Wang, Jin Wu, Xiaoming Wang, Yaqiao Zhu, Shihui Zhang	
Research on SLAM Algorithm and Navigation of Mobile Robot Based on ROS	119
Bin Liu, Zhiwei Guan, Bin Li, Guoqiang Wen, Yu Zhao	
Switching Control Strategy Study of Dual-Fuel Gas Turbine	125
Zhen Yang , Yan Wang	
Design of ADRC for Unmanned Surface Vehicle Heading Based on Immune Particle	130
Swarm Optimization	

	Mingyu Fu, Qiusu Wang, Yuchao Wang, Yujie Xu	
	Research on Vibration Event's Feature Extraction Method of Φ-OTDR System	136
	Haiqiang Zhu, Baofeng Zhang, Zhili Zhang, Huimin Gao	
	Image Matching Algorithm Based on Improved FAST and RANSAC	142
	Qiongnan Yang, Chenguang Qiu, Litao Wu, Jianjun Chen	
	Active Noise Cancellation Techniques to Enhance Audition in Noisy Cities	148
	J. Alan Calderón Ch., John Lozano, Benjamín Barriga, Julio Tafur, Juan Carlos	
	Lengua, Gonzalo Solano	
	Energy Conserving Path when Chasing an Intruder by Autonomous Guards	152
	Doron Nussbaum	
	An MR Fluid based Master Manipulator of the Vascular Intervention Robot with	158
	Haptic Feedback	
	Qiang Gao, Yu Zhan, Yu Song, Junjie Liu, Jiabin Wu	
	A Novel Contact Force Measurement Scheme for Slave Catheter Robot in Robotic	164
	Endovascular Surgery	
	Qiang Gao, Jiabin Wu, Yu Song, Junjie Liu, Zemin Mao, Yu Zhan	
	Design and Development of a Bladder Volume Determination Device Based on	170
	A-mode Ultrasound	
	Qiang Gao, Yunfei Gao, Zemin Mao, Chunping Liu, Yu Song, Haobo Zhang, Zixuan	
	Zhang	
	Fixed-time Attitude Feedback Control for Quadrotor UAV based on Fixed-time	176
	Extended State Observer Junfang Li, Lei Liu, Junjie Liu	
		400
	Robust Controller Design Based on Policy Iteration Qiang Gao, Xuxi Yang, Yuehui Ji, Junjie Liu	182
4		
1	Signal and Image Processing (I)	
	Hand Gesture Recognition Based on a Nonconvex Regularization	187
	Jing Qin, Joshua Ashley, Biyun Xie	
	All-Around 3D Reconstruction from Spherical Images with Semantic Segmentation	193
	Tuulia Pennanen, Siva Ariram, Antti Tikanmäki, Juha Röning	
	3D-Printed Balloon Type Pneumatic Actuator for Hybrid Force Display Glove*	200
	Ken'ichi Koyanagi, Takumi Tamamoto, Kentaro Noda, Takuya Tsukagoshi, Toru	
	Oshima, Daisuke Takata	

	A Back-Support Exoskeleton with a Cable-Driven Series-Parallel Elastic Actuation:	206
	Prototype Design and Operational Analysis	
	Hugo Hung-tin Chan, Hongpeng Liao, Fei Gao, Xuan Zhao, Wei-Hsin Liao	
	Research on Gait Recognition Based on Lower Limb EMG Signal	212
	Junyao Wang, Yuehong Dai, Tong Kang, Xiaxi Si	
	Automated Real-time 3D Visual Servoing Control of Single Cell Surgery Processes	218
	Bo Wen Yao, James K. Mills	
MP2-1	Signal and Image Processing (II)	
	An Evaluation of RGB-Thermal Image Segmentation for Snowy Road Environment	224
	Sirawich Vachmanus, Ankit A. Ravankar, Takanori Emaru, Yukinori Kobayashi	
	Research on Sonar Image Denoising Method Based on Fixed Water Area Noise	231
	<u>Model</u>	
	Min Chen, Lei Li, Zejie Li, Xiaomei Xie	
	Automatic Intracranial Aneurysm Segmentation Based on Spatial Information Fusion	236
	Feature from 3D-RA Using U-Net	
	Mengqi Cheng, Nan Xiao, Hang Yuan, Kaidi Wang	
	Attenuation Coefficient of Tissue Based on Modified Depth-Resolved Model	242
	Lin Huang, Yana Liu, Xiao Zhang, Qin Li	
	A Zigzag Maneuver Target Tracking Algorithm with Colored Glint Measurement	248
	Noise The Control of	
	Chenghao Shan, Weidong Zhou	
	Design of Convenient Structured Light Projection System for Microscopic	253
	Measurement Viscons Du Vuccion Mans Vaufan Bans	
	Yimeng Du, Yuezong Wang, Youfan Peng	
MP3-1	Signal and Image Processing (III)	
	A Super Baseline for Pedestrian Re-Identification	259
	Jiwei Zhang, Haiyuan Wu	
	A Feature Fusion Model for Person Identification Using Top-view Image	264
	Jiwei Zhang, Haiyuan Wu	
	Improving Caption Consistency to Image with Semantic Filter by Adversarial Training	269
	Junlong Feng, Jianping Zhao	
	Profile Fitting-based Small Target Detection in Water for Side-scan Sonar Image	275

	Zhanshuo Liu, Xiufen Ye, Shuxiang Guo, Huiming Xing, Zengchao Hao, Yao Li	
	A Lightweight Defect Detection Algorithm of Insulators for Power Inspection	281
	Lei Yang, Shouan Song, Yong Niu, Yanhong Liu	
	Research on Recognition of Pointer Meter Based on Improved East Algorithm	287
	Lei Shao, Yuxiang Chen, Xiaoning Xu, Wentao Sun, Hongli Liu	
MP1-2	Modeling, Simulation Techniques and Methodologies (I)	
	A Rollover Strategy for Wrist Damage Reduction in a Forward Falling Humanoid Dongdong Liu, Yuhang Lin, Vikram Kapila	293
	Automated Exploration, Capture and Photogrammetric Reconstruction of Interiors <u>Using an Autonomous Unmanned Aircraft</u>	301
	Markus Lieret, Vladyslav Kogan, Christian Hofmann, Jörg Franke	
	Development of a Fixture for the Vascular Interventional Surgical Robotic System	307
	Jian Guo, Xiuqiang Shao, Shuxiang Guo	
	A Discrete Particle Swarm Optimization for Storage Location Assignment Problem of	313
	Retail E-Commerce	
	Chaodan Zhao, Jianping Dou, Xia Zhao	
	Trajectory Tracking Control for a Biomimetic Spherical Robot Based on ADRC	319
	Mugen Zhou, Shuxiang Guo, Xihuan Hou, He Yin, Ao Li, Debin Xia, Zan Li, Meng Liu	
	Robust Optimization Design of Gun Turret Structure for Lightweight	325
	Yao Ge, Longmiao Chen, Jianhui Tan, Caicheng Yue	
MP2-2	Modeling, Simulation Techniques and Methodologies (II)	
	Optimization of Pin Arrangement and Geometry in EV and HEV Heat Sink Using	332
	Genetic Algorithm Coupled With CFD	
	Weichang Yang, James K. Mills	
	UR5 Robot Manipulation Using Matlab/Simulink and ROS	338
	Andres Vivas, José Maria Sabater	
	A Multi-Physics Simulation Approach to Predict Shape Morphing of Flexible Devices	344
	in Magnetic Field	
	Huichen Ma, Junjie Zhou	
	A Fast Algorithm of Normal Vector Calculation for NURBS Surface Based on Taylor	350
	<u>Expansion</u>	
	Yinuo Zhou, Qiang Liu, Zhenshuo Yin, Sanying Zhu	

	Assessment of Large Vessel Support Capability Based on Comprehensive Weighting	356
	<u>Model</u>	
	Peng Shang, Yanhua Sun, Zhuo Zhou, Nieyong Huang, Jian Zhou	
	On Combined Elastic and Nonholonomic Model of a Class of Mobile Robots with Arc	363
	<u>Wheels</u>	
	Xuchao Huang, Songxin Zhou, Zhi Yang, Yisheng Guan	
MP3-2	Modeling, Simulation Techniques and Methodologies (III)	
	Study on Propagation Characteristics of Refracted Longitudinal Waves in Carbon	370
	Fiber Composites	
	Qinxue Pan, Yunmiao Zhang, Lang Xu, Rui Luo, Shuangyang Li, Wei Li, Sa Li	
	Remaining Useful Life Indirect Prediction of Lithium-ion Batteries Based on Dropout	375
	Gated Recurrent Unit	
	Meng Wei, Min Ye, Qiao Wang, Xinxin Xu	
	A Novel State of Charge Estimation Method of Lithium-ion Battery Based on NARX	381
	Neural Network Model	
	Qiao Wang, Min Ye, Meng Wei, Chenguang Wu, Xinxin Xu	
	Discussion and Improvement of the Rectification Capability of NEL Rectifier under the	386
	Concentric Reducer Based on FLUENT Simulation	
	Yuchuan Li, Chao Dong, Xin Shao, Siqi Han, Tao Wang	
	Research on Energy Consumption Forecast of Enterprise Power Equipment Based	391
	on Algorithm Fusion Model	
	Ji Li, Xiang Ma, Chao Li, Lei Shao	
	Research on Line Loss Calculation of Urban Cable Line	397
	Yali Liu, Yingna Li, Chuan Li	
MP1-3	Control Theory and Application (I)	
	Conservatism Comparison of SUIO and Luenberger Observer in Invariant Set-Based	403
	Robust Fault Detection for LPV Systems	
	Bo Min, Jun Yang, Junbo Tan, Changliang Wang, Xueqian Wang	
	Zero-sequence Circulating Current Suppression Strategy for Microgrid Inverters	409
	Xuesong Zhou, Kairui Guo, Youjie Ma, Weibao Zhong	
	Research on Auto Disturbance Rejection Control Strategy of Battery Energy Storage	414
	Staggered Parallel Buck Converter	
	Xuesong Zhou, Diankang Su, Youjie Ma, Junqing Pan	

	Vector Control of Active Disturbance Rejection Induction Motor based on Sliding	420
	Mode Variable Structure	
	Xuesong Zhou, Junqing Pan, Youjie Ma, Diankang Su	
	MPPT Control of Photovoltaic System Combined with Correction Link and LADRC Youjie Ma, Congcong Wei, Xuesong Zhou, Weibao Zhong	426
	Modeling and Control Strategy Simulation of Dual Active Bridge DC-DC Converter Youjie Ma, Hongyu Wen, Xuesong Zhou, Jie Yin	431
MP2-3	Control Theory and Application (II)	
	Error-constrained Moving Path-Following Control for a Stratospheric Airship Liran Sun, Ming Zhu, Xiao Guo, Jiace Yuan, Huabei Gou	436
	Experimental Validation of the Open-Source DMPC Framework GRAMPC-D Applied to the Remotely Accessible Robotarium	442
	Daniel Burk, Andreas Völz, Knut Graichen Forceps Motion Estimation in Laparoscopic Surgery Using Deep Learning for Robotic Camera Control Masahiko Minamoto, Yamato Umetani, Shigeki Hori, Tetsuro Miyazaki, Kenji Kawashima	448
	Rectifier Stage Control Strategy for Solid State Transformer Based on Sliding Mode Active Disturbance Rejection Zhiqiang Gao, Jiafeng Liu, Xuesong Zhou, Youjie Ma	454
	Three-Level Control of DC Side Voltage Balance of Cascaded H-Bridge APF Yunliang Wang, Zichen Li, Yanjuan Wu, Zhengkun Bai, Ang Li	460
	A General Approach to Modeling Demand-Side Resources Yunliang Wang, Zhengkun Bai, Yanjuan Wu, Zichen Li, Ang Li	465
MP3-3	Control Theory and Application (III)	
	Stable Tuning of Extended State Observers Using PSO and Penalty Functions Ricardo Cortez, Ruben Garrido	471
	Self-Imitation Learning for Robot Tasks with Sparse and Delayed Rewards Zhixin Chen, Mengxiang Lin	477
	<u>Disturbance Rejection via Fuzzy Control with Disturbance Observer for Active</u> <u>Magnetic Bearing System</u> Bo Wang, Haipeng Geng, Wei Zheng, Jiayi Yao, Dingchong Lyu	483

	Deep Transfer Learning in Inter-turn Short Circuit Fault Diagnosis of PMSM	489
	Yuefeng Fang, Manyi Wang, Liuxuan Wei	
	Decomposition of Complex System and Multi-level Control Method based on Control	495
	Allocation	
	Chao Jia, Ziyu Li, Jiaxin Wei, Lifeng Du	
	Application of Maximum Power Point Tracking Control in Pendulum Wave Energy	501
	Converter	
	Chunjie Wang, Xuece Li, Peng Chen, Lin Cui	
MP1-4	Control Theory and Application (IV)	
	SINS Stationary Base Initial Alignment Based on Backtracking Scheme	507
	Xuan Xiao, Yongyan Zhang	
	Simulation Design of Intelligent Vehicle Transverse Control System	514
	Mingqiu Guo, Yunde Shi, Dan Xia	
	High Voltage Gain DC-DC Converter with Bridge-Double-Voltage Cell Based on	520
	Coupled Inductor	
	Chunjie Wang, Hao Yu, Lin Cui	
	Application of SOC Estimation Based on Unscented Kalman Filter in	526
	Photovoltaic-mains Complementary Power Management System	
	Lei Shao, Chenyang Yan, Huapeng Zeng	
	Research on Improved p-q Reactive Current Detection Method Based on	531
	Synchronous Rotary Angle	
	Xuesong Zhou, Weibao Zhong, Youjie Ma, Kairui Guo	
	Model Reference Scheduling and Robust Resilient H-infinity Control Co-design with	537
	<u>Time-delay</u>	
	Shunli Zhao	
MP2-4	Control Theory and Application (V)	
	Code Summarizer	542
	Shreya Rajendra Mehta, Sneha Sunil Patil, Nikita Shailesh Shirguppi, Vahida Attar	
	Fault Grouping Bias Strategy of Thrust Allocation for Dynamic Positioning Ship	548
	Fuguang Ding, Junfeng Zhang, Yuanhui Wang	
	Robust Adaptive Back-stepping Control for Nonlinear Systems with Unknown	554
	Backlash-like Hysteresis	
	Yanyan Chen, Yue Wang, Qi Dong, Guiming Zhu, Jingjing Feng, Feiyun Xiao	

	Research on Control Strategy of Bidirectional DC-DC Converter Based on Enhanced	560
	<u>ADRC</u>	
	Xuesong Zhou, Bingjie Xie, Youjie Ma, Qian Liu	
	Reduced-order Active Disturbance Rejection Control of DC-Link Voltage of	565
	Photovoltaic Grid-connected Inverters	
	Xuesong Zhou, Qian Liu, Youjie Ma, Bingjie Xie	
	Application of Model Compensated Active Disturbance Rejection Control in Electric	570
	Vehicle Charging	
	Youjie Ma, Min Yan, Xuesong Zhou, Jie Yin	
MP3-4	Neuro, Fuzzy, and Intelligent Control	
	A System to Identify Walking Pattern Using Machine Learning for a Load Reduction	576
	Exoskeleton Robot	
	Hanqing Zhao, Hidetaka Nambo	
	Learning the Spatial Perception and Obstacle Avoidance with the Monocular Vision	582
	on a Quadrotor	
	Jiajun Ou, Xiao Guo, Wenjie Lou, Ming Zhu	
	Fault Diagnosis Method of Reciprocating Compressor Based on Domain Adaptation	588
	under Multi-working Conditions	
	Lijun Zhang, Lixiang Duan, Xiaocui Hong, Xinyun Zhang	
	The Vector Control Scheme for Amphibious Spherical Robots Based on	594
	Reinforcement Learning	
	He Yin, Shuxiang Guo, Liwei Shi, Mugen Zhou, Xihuan Hou, Zan Li, Debin Xia	
	Fuzzy-Improved Linear Active Disturbance Rejection Control of Solid State	600
	Transformer Inverter Stage	
	Youjie Ma, Tong Zhang, Xuesong Zhou	
	Perturbation Fuzzy Neural Fractional-order Sliding Mode Control of Micro Gyroscope	606
	Juntao Fei, Jie Zhuo, Fang Chen	
MP1-5	Organized session: Biomimetic Underwater Robots	
	<u>D* Lite-Based Navigation Algorithm for Multiple Spherical Underwater Robots</u>	611
	Collaboration	
	Awa Tendeng, Shuxiang Guo, Ruochen An, Chunying Li	
	Motion Stability Evaluation of the Improved Spherical Underwater Robot with Hybrid	617
	Propulsion Devices	

	Chunying Li, Shuxiang Guo, Jian Guo, Ruochen An, Awa Tendeng	
	Dynamic Modeling and Optimization of Robotic Fish Based on Passive Flexible	622
	<u>Mechanism</u>	
	Qianqian Zou, Ben Lu, Yuzhuo Fu, Xiaocun Liao, Zhuoliang Zhang, Chao Zhou	
	Numerical Exploration on Pitching Motion of Robotic Dolphin Realized by Pectoral	628
	<u>Fin</u>	
	Jiabo Cao, Zhihan Li, Xufeng Zhou, Dan Xia	
	Study on Hydrodynamic Characteristics and Dynamics Model of Underwater	633
	Spherical Robot	
	Ao Li, Shuxiang Guo, Liwei Shi, Xihuan Hou, Zan Li, Debin Xia	
	Trajectory Tracking Control of an Amphibious Spherical Robot Using MPC Approach	639
	Meng Liu, Shuxiang Guo, Liwei Shi, Xihuan Hou, He Yin, Ao Li, Zan Li, Debin Xia, Mugen Zhou	
MP2-5	Organized session: New Mobile Mechanism and Control	
	Power-assisted Three-wheel Carrier Cart With Stair-climbing Ability	645
	Isaku Nagai, Daisuke Kijihana, Keigo Watanabe	
	Position Control for Half-Drone Wheeled Inverted Pendulum Robot	651
	Rintaro Hoji, Shoichi Maeyama, Takuro Kono, Toshinobu Takei, Shin'ichi Yuta	
	Application of Maximum Hands-off Distributed Control to a Quadrotor Group	657
	Kimiko Motonaka, Takuya Watanabe, Yuhwan Kwon, Masaaki Nagahara, Seiji	
	Miyoshi	
	Study on Propulsion of a Snake Robot with Torque Propagation Based on Modified	
	<u>Curvature Derivatives</u>	663
	Yongdong Wang, Tetsushi Kamegawa, Akio Gofuku	
	Prototype of Wheeled Stilts-Type Personal Micro-Mobility	669
	Toshinobu Takei, Masahiro Takeshita, Akira Torige	
	Development of Weeding Turtle Robot for Paddy Fields	675
	Issa Nakamura, Tatsuya Kato, Hirofumi Ohtsuka	
MP3-5	Organized session: Biomimetic Measurement and Control in Robotics	
	A Range-finding System Using Multiple Lasers for an Underwater Robot with	681
	Pectoral-fin Propulsion Mechanisms and Improving Its Accuracy by a Gimbal	
	<u>Mechanism</u>	
	Takashi Utsumi, Keigo Watanabe, Isaku Nagai	

	Production of a Small-sized Tandem Rotor Aircraft with Two Tiltable Coaxial Rotors	687
	and Its Experiments	
	Hideaki Komura, Keigo Watanabe, Isaku Nagai	
	Experimental Verfication on the Rotational and Sway Control of a Suspended	692
	Horizontally Movable Multi-Rotor	
	Kazuya Miyamoto, Shinsuke Kanda, Keigo Watanabe, Isaku Nagai	
	Visual Feedback Control and Transfer Learning-Based CNN for a Pick and Place	697
	Robot on a Sliding Rail	
	Fusaomi Nagata, Kohei Miki, Keigo Watanabe, Maki K. Habib	
	A Probabilistic Models Fusion Based Contact Detection for Quadruped Robot	703
	Xuesheng Li, Yage Shen, Cong Luo, Qiwei Xu, Xinlei Chen, Chen Li	
	Design of a Novel Cable-Driven 3-DOF Series-Parallel Wrist Module for Humanoid	709
	<u>Arms</u>	
	Zhihao Liang, Bin Wang, Yaowei Song, Tao Zhang, Chaoqun Xiang, Yisheng Guan	
MP1-6	Signal and Image Processing (IV)	
	Identification of Binge Drinkers via Convolutional Neural Network and Support Vector	715
	<u>Machine</u>	
	Guangfei Li, Sihui Du, Jiaxi Niu, Zhao Zhang, Tianxin Gao, Wuyi Wang, Chiang-Shan	
	R. Li, Xiaoying Tang	
	Simulation Research of One-Dimensional Magnetic Particle Imaging	721
	Xiaojun Chen, Xiao Han, Xiaolin Wang, Xiaoying Tang	
	A Novel Target Detector of Marine Radar Based on HOG Feature	727
	Zhizhong Lu, Yue Shi	
	Three-dimensional Ambient Perception Method Based on Binocular Stereo Visual	733
	and Structural Light	
	Qi Zeng, Junchao Zhu, Baofeng Zhang, Huifeng Cao, Chang Jia	
	Directional Navigability Analysis of Local Gravity Map Based on Selective Ensemble	738
	Learning	
	Fangming Li, Dan Zhao, Fanming Liu	
	Research on Vehice Motion Control Based on Electromyography Signal Collected	744
	and Processed by MCU and Computer Platform	
	Baofeng Gao, Binkai Yang, Kaijun Guo, Tao Chen, Mingliang Zheng	
MP2-6	Vision System, Robotic Vision	

	Towards a Micron-level Line Structured Light	750
	Yue Guo, Yanmei Li, Haitao Song, Wenhao He, Kui Yuan	
	Instance Segmentation of Low-texture Industrial Parts Based on Deep Learning	756
	Yue Zhang, Zelin Shi, Chungang Zhuang	
	An Improved QPSO Algorithm Based on EXIF for Camera Self-calibration	762
	Pengxiao Bao, Feng Gao, Liwei Shi, Shuxiang Guo	
	YOLO Target Detection Algorithm with Deformable Convolution Kernel	768
	Hui Wang, Shuai Zhang, Lijun Yu, Ce Shi	
	Research on CAMshift Algorithm Based on Feature Matching and Prediction	773
	<u>Mechanism</u>	
	Hui Wang, Quchang Zhang, Lijun Yu, Zhiqiang Wang	
	Improved MB-LBP Feature Extraction Algorithm Based on Reduced-dimensional	779
	<u>HOG</u>	
	Lijun Yu, Qing Li, Hui Wang, Ce Shi	
MP3-6	Sensor Design, and Novel Sensing Systems	
	Extraction of Pedestrian Position and Attribute Information Based on the Integration	784
	of LiDAR and Smartphone Sensors	
	Zhengshu Zhou, Saya Kitamura, Yousuke Watanabe, Shunya Yamada, Hiroaki Takada	
	Motion Measurement and Segmentation Toward Automated Sewing Operations	790
	Yaqiang Mo, Yuto Nakagawa, Kotaro Nagahama, Kimitoshi Yamazaki	
	A Multi-sensor Intelligent Surface Garbage Cleaning Robot	797
	Yunliang Wang, Yiwen Zhao, Yanjuan Wu, Sai Zhang, Jian Wang	
	An Energy-efficient and Redundancy-reduced Protocol of WSN under Non-Uniform	802
	<u>Deployment</u>	
	Yuxiu Lin, Xiaomei Xie, Mingzhu Wei, Tonghui Zeng, Xiangfei Wu, Xin Chen, Omar	
	Mechali	
	Information Manifold and Ricci Curvature	808
	Mo Tao, Shaoping Wang, Hong Chen, Zhi Liu, Yi Lei	
	Research on the State Acquisition Method of Anti-seismic Support and Hanger	813
	Yingxin Wang, Junchao Zhu, Qingliang Zhu, Yongcheng Zhang	
TA1-1	Intelligent Mechatronics and Application (I)	

	Deep Q-learning for Control: Technique and Implementation Considerations on a Physical System: Active Automotive Rear Spoiler Case	818
	Victor Miguel Velazquez Espitia, Jose Angel Gonzalez Gonzalez, Omar Mata Juarez, Pedro Ponce, Arturo Molina	
	Mechanism and Design of Tableware Tidying-up Robot for Self-Service Restaurant Deheng Zhu, Hiroaki Seki, Tokuo Tsuji, Tatsuhiro Hiramitsu	825
	Intraoperative Kinematic Analysis of Autonomous Cornea Suturing Surgical Robot for	
	<u>Keratoplasty</u>	831
	Xiaojing Feng, Xiaodong Zhang, Xiaojun Shi, Li Li	
	Injection Molding of Cell Membrane Perforator with Photochemical Perforation	837
	Function and Surface Modification	
	Kohei Kobayashi, Kenji Imamura, Kiriro Suzuki, Koki Takemasa, Takashi Kei Saito	
	A Novel Remote Control Method Oriented to Underwater Manipulators	843
	Zhiheng Zheng, Jirong Xie, Tao Su, Xinguang Li, Yu Ni	
	Classification and Detection Method of Blood Lancet based on VGG16 Network	849
	Feng Zhao, Baofeng Zhang, Zhili Zhang, Xinghui Zhang, Chunyu Wei	
TA2-1	Intelligent Mechatronics and Application (II)	
	Pallet Detection and Estimation for Fork Insertion with RGB-D Camera	854
	Ryosuke linuma, Yusuke Hori, Hiroyuki Onoyama, Yukihiro Kubo, Takanori Fukao	
	Development of Interface for Turning Motion Assist of Power Assist System Using 3D Sensor	860
	Hironao Yamada, Takahiro Ikeda, Satoshi Ueki, Katsutoshi Ootsubo	
	Design and Simulation of Lift Feedback Fin Stabilizer Control System Based on	865
	Hardware-in-the-Loop System Library Liang Vientage Lia Thissen La Sangtage Thomas	
	Lihua Liang, Jianfeng Li, Zhiwen Le, Songtao Zhang	a= 1
	A Game-Based Fault-Tolerant Path Planning Algorithm for Space Manipulator Shuo Wang, James Zhiqing Wen, Decheng Zhou, Yujin Wu	871
TP1-1	Medical, Biomedical and Rehabiitation Systems (I)	
	Development of a Knee Extensors Training System with Active Resistance	878
	Component	
	Zixi Gu, Ko Matsuhiro, Jiei Yanagi, Kazuhiko Mizukami, Ryuya Watanabe, Hiroaki Eto, Sarah Cosentino, Atsuo Takanishi	
	Prototype of the Record and Evaluation System of the Locomotion Experience Using	884

	the Electric Mobility Support Device	
	Rikuya Tsujinaka, Toshihiko Yasuda, Yasutaka Nishioka, Mitsuhiro Yamano	
	A New Anthropomorphic Thumb Configuration With Passive Finger Torsion	890
	Ang Ke, Jian Huang, Jiping He	
	ESPI: Dynamic Safety Evaluation Index for Human-Exoskeleton System	897
	Fashu Xu, Xinyue Gu, Jing Qiu, Rui Huang, Hong Cheng	
	Study on Tracking Control of Vascular Interventional Surgical Robot based on	903
	Autocoupling PID	
	Shuxiang Guo, Zefa Sun, Jian Guo	
	Design of a Variable Stiffness Series Mechanism	909
	Qiang Fu, Xun Li, Jian Guo, Shuxiang Guo, Zhuocong Cai, Jiajun Fu	
TP2-1	Medical, Biomedical and Rehabiitation Systems (II)	
	Design and Characterization of a Cable-Driven Series Elastic Actuator Based Torque	914
	Transmission for Back-Support Exoskeleton	
	Hongpeng Liao, Hugo Hung-tin Chan, Fei Gao, Xuan Zhao, Wei-Hsin Liao	
	Development of a Walking-Trajectory Measurement System	920
	Nina Tajima, Koichiro Kato, Daigo Kurokawa, Nobuto Matsuhira, Kanako Amano,	
	Yuka Kato	
	A New Collision Detection Algorithm for Vascular Interventional Surgery Simulation	926
	Training System	
	Jian Guo, Zhentao Wang, Shuxiang Guo	
	Study on Contact Force Prediction for the Vascular Interventional Surgical Robot	932
	based on Parameter Identification	
	Shuxiang Guo, Xianguo Liao, Jian Guo	
	Design of a Novel Drug-Delivery Capsule Robot	938
	Shuxiang Guo, Yaqi Hu, Jian Guo, Qiang Fu	
	Design and Evaluation of a Novel Magnetoactive Biopsy Capsule Endoscope Robot	944
	Jian Guo, Xinyi Liu, Shuxiang Guo, Qiang Fu	
TA1-2	Manipulator Control and Manipulation (I)	
	A Six-degree-of-freedom Face Tracking Method for Non-contact Physiological	950
	Detection Robot *	
	Haoran Zhang, Bingzheng Fan, Xiaoman Zhang, Hang Zhan, Xiaojian Li	

	Kinematics Redundancy Identification of Arbitrary Serial Robot	956
	Lingxiao Li, Guojiang Li, Lu Li, Yanan Wang, Baolin Feng	
	Control Method for Robotic Manipulation of Heavy Industrial Cables	963
	Fangli Mou, Dan Wu	
	Real-Time Pixel-Wise Grasp Detection Based on RGB-D Feature Dense Fusion	970
	Yongxiang Wu, Yili Fu, Shuguo Wang	
	Magnetically Driven Rolling Motion for Magnetic Cylindrical Microrobots	976
	Hongzhe Liao, Xiaoming Liu, Dan Liu, Yu Ning, Qiang Huang, Tatsuo Arai	
	Real-time Gesture Recognition Based on Improved Artificial Neural Network and	981
	sEMG Signals	
	Wenzhe Zhang, Liguo Shuai, Haoxuan Kan	
TA2-2	Manipulator Control and Manipulation (II)	
	Perovskite Photovoltaic Tracking Systems for Efficient Irrigation in the Agricultural	987
	Field: Morocco Case Study	
	Yousra Bensouda, Yasmine Boudihaj, Nada Sebti, Hajar Hassina, Yassine Salih-Alj	
	Stabilization of Double Inverted Pendulum (DIP) on a Cart Using Optimal Adaptive	993
	Sliding Mode Control (OASMC)	
	Maki K. Habib, Samuel A. Ayankoso	
	Data-Driven Modeling: Concept, Techniques, Challenges and a Case Study	1000
	Maki K. Habib, Samuel A. Ayankoso, Fusaomi Nagata	
	Vision-Based One-Shot Imitation Learning Supplemented with Target Recognition via	1008
	Meta Learning	
	Xuyun Yang, Yueyan Peng, Wei Li, James Zhiqing Wen, Decheng Zhou	
TP1-2	Organized session: Medical Robots for Minimal invasive Surgery (I)	
	Trajectory Planning of an Underactuated Cable-Driven Planar Device for the Trunk	1014
	Lailu Li, Shuoyu Wang, Guang Yang	
	Resistance Recognition of Moving Guidewire in Vascular Interventional Operation	1021
	Chuqiao Lyu, Shuxiang Guo, Youchun Ma, Yue Wang, Chenguang Yang	
	A Teleoperation Control Method for Vascular Interventional Surgery Robot	1027
	Hang Yuan, Nan Xiao, Mengqi Cheng, Kaidi Wang	
	Evaluation of a Reinforcement Learning Algorithm for Vascular Intervention Surgery	1033
	Fanxu Meng, Shuxiang Guo, Wei Zhou, Zhengyang Chen	

	Mechanism Design, Kinematic and Hydrodynamic Simulation of a Wave-driven Amphibious Bionic Robot Thomasin Thomas Live Shi, Shuviana Cua, Ho Vin, An Li, Bangving Rose, Mang Live	1038
	Zhongyin Zhang, Liwei Shi, Shuxiang Guo, He Yin, Ao Li, Pengxiao Bao, Meng Liu Evaluation of a Clamping Mechanism for Vascular Interventional Surgery Robotic System Chaochao Shi, Shuxiang Guo	1044
TP2-2	Organized session: Medical Robots for Minimal invasive Surgery (II)	
	A Novel Tremor Suppression Method for Endovascular Interventional Robotic Systems Xinming Li, Shuxiang Guo, Peng Shi, Xiaoliang Jin	1050
	Preliminary Method for Reducing Contact Force between Catheter Tip and Vessel Wall in Endovascular Surgery	1055
	Xiaoliang Jin, Shuxiang Guo, Jian Guo, Peng Shi, Xinming Li	
	Centerline Extraction Method for Virtual Vascular Model in Virtual Reality Interventional Training Systems	1060
	Peng Shi, Shuxiang Guo, Xiaoliang Jin, Xinming Li	
	Force Analysis of Catheter Tip Influenced by Multiple Factors in Interventional	1065
	Surgery Robot	
	Chenguang Yang, Shuxiang Guo, Chuqiao Lyu, Youchun Ma, Yue Wang	
	An Image Information-based Classification Method for Vascular Interventional	1071
	Surgery Operating Skills Yue Wang, Jin Guo, Shuxiang Guo, Chuqiao Lyu, Youchun Ma, Chenguang Yang, Zeyu Li	
	Study on the Automatic Surgical Method of the Vascular Interventional Surgical	1076
	Robot Based on Deep Learning	
	Jian Guo, Suxiang Feng, Shuxiang Guo	
TA1-3	Mobile Robot System (I)	
	Swipe Gesture Robotic System Based on Image Processing and Servo	1082
	Compensation	
	Koichi Tokairin, Daisuke Koyama, Kotaro Hashikura, Md Abdus Samad Kamal, Kou Yamada	
	Hexapod Robot with Ground Reaction Force Sensor on Rough Terrain	1088
	Meifen Cao, Koumei Yamashita, Takaki Kiyozumi, Yusuke Tada	

	Research and Analysis of Comprehensive Optimization Method for Energy	1094
	Consumption and Trajectory Error of the Leg Structure Based on Virtual Model	
	Control	
	Geqi Lin, Wenchuan Jia, Shugen Ma, Jianjun Yuan, Yi Sun	
	Mobile Robot Path Planning Based on Improved Ant Colony Fusion Dynamic Window	1100
	<u>Approach</u>	
	Lei Shao, Qi Li, Chao Li, Wentao Sun	
	Interaction-Aware Crowd Navigation via Augmented Relational Graph Learning	1106
	Qing Xu, Wangli He, Naoyuki Kubota	
	Control of a Lower Limb Exoskeleton Robot by Upper Limb sEMG Signal	1113
	Shuxiang Guo, Yibin Ding, Jian Guo	
TA2-3	Mobile Robot System (II)	
	LIDAR Graph SLAM based Autonomous Vehicle Maps Using XY and Yaw	1119
	Dead-Reckoning Measurements	
	Mohammad Aldibaja, Reo Yanase, Takahiro Furuya, Akitaka Oko, Naoki Suganuma	
	Local Path Planning Using Distance-Type Fuzzy Reasoning Method in Unstructured	1126
	and Dynamic Construction Sites	
	Guang Yang, Shuoyu Wang, Hajime Okamura, Yasuhiro Ueda, Toshiaki Yasui,	
	Tetsuya Yamada, Yuki Miyazawa, Satomi Yoshida, Yuta Inada, Shingo Ino, Kazuo	
	Okuhata, Yoshinobu Mizobuchi	
	Study on Positioning for the Spherical Amphibious Robot Based on Visual-Inertia	1132
	Localization	
	Jian Guo, Xiangyu Chen, Shuxiang Guo, Jigang Xu	
	Multi-robot Multi-path Intelligent Planning Based on Universal Conflict Resolution and	1138
	Free Crossing Emergence	
	Zeyu Zhou, Mingyang Li, Jingxi Zhang, Xiongwei Wu, Wei Tang	
TP1-3	Mobile Robot System (III)	
	A kind of Sea-fog Removal Algorithm Fusing Image Enhancement and End-to-end	1146
	<u>Network</u>	
	Zhongli Ma, Lili Wu, Linshuai Zhang, Jiadi Li, Yuehan Zeng	
	Design of Automatic Picking Robot Based on 2-DOF Stabilized Platform	1152
	Chao Zhang, Bing Zhang, Hao Zhang	
	Research on Underwater Target Detection Method Based on Improved MSRCP and	1158

YOLOv3

	i ongxu Guo, Yannui Wei, Hong Snao, Boye Ma	
	Unit Dual Quaternion Based Set-Point Control with Input Constraints	1164
	Wenxin Hu, Yajing Wang, Xiangke Wang	
	Finite-Time Attitude Control of Uncertain Quadrotor Aircraft via Continuous Terminal	1170
	Sliding-Mode-Based Active Anti-Disturbance Approach	
	Omar Mechali, Jamshed Iqbal, Abdesselam Mechali, Xiaomei Xie, Limei Xu	
	A Variable Artificial Potential Field Method for Gait Generation of Quadruped Robot	1176
	Feng Zhuo, Wenchuan Jia, Shugen Ma, Jianjun Yuan, Yi Sun	
TP2-3	Mobile Robot System (IV)	
	Development of Prototype Electric-driven 2-DoF Monopod Robot for Hopping Motion	1182
	Asahi Anzai, Toshihide Doi, Kazuki Hashida, Xuechao Chen, Lianqiang Han, Kenji	
	Hashimoto	
	Active Cross-domain Self-localization Using Pole-like Landmarks	1188
	Kanji Tanaka	
	Underwater Motion Characteristics Evaluation of a Bio-inspired Father-son Robot	1195
	Ruochen An, Shuxiang Guo, Chunying Li, Awa Tendeng	
	Natural Residual Reinforcement Learning for Bicycle Robot Control	1201
	Xianjin Zhu, Xudong Zheng, Qiyuan Zhang, Zhang Chen, Yu Liu, Bin Liang	
	Study on a Novel Network Nod Monitoring System based on the Spherical Multi-robot	1207
	Shuxiang Guo, Ran Wang, Jian Guo, Jigang Xu	
	Classification of Aquatic Animals by the Spherical Amphibian Robot based on	1213
	Transfer Learning	
	Shuxiang Guo, Shaolong Wang, Jian Guo, Jigang Xu	
TA1-4	Biomimetic Systems	
	An Elastic Biomimetic Fish Tail and Its Undulation Fitting Method of Body Wave	1219
	Xiaocun Liao, Yuzhuo Fu, Ben Lu, Qianqian Zou, Zhuoliang Zhang, Chao Zhou	
	A Combined Indoor Self-positioning Method for Robotic Fish Based on Multi-sensor	1226
	<u>Fusion</u>	
	Yuzhuo Fu, Ben Lu, Xiaocun Liao, Qianqian Zou, Zhuoliang Zhang, Chao Zhou	
	Design of a Novel Quadruped Robot Based on Tensegrity Structures	1232
	Ruiqi Gao, Yixiang Liu, Qing Bi, Bin Yang, Yibin Li	

	Influence of the Pappus Shape of Bionic Dandelion Aircraft on Drag Characteristics	1238
	Min Chen, Wen Zhu, Yongchen Liu, Xiaomei Xie, Lei Guo, Ao Jiao	
	Structural Synthesis of Nested Hyper-redundant Mechanisms Inspired by the	1244
	Mackerel Fishes	
	Weiwei Chen, Hongzhou Jiang	
	Structure Design and Mathematical Modeling of Bionic Butterfly Flapping Wing	1249
	Aircraft Year To the Windows All Control of the Co	
	Yue Zhu, Hengjing Huang, Yanlong Wang, Zhenfeng Han, Jun Zhong	
TA2-4	Mobile Robot System (V)	
	Garbot - Semantic Segmentation for Material Recycling and 3D Reconstruction	1255
	<u>Utilizing Robotics</u>	
	Siva Ariram, Tuulia Pennanen, Antti Tikanmäki, Juha Röning	
	Investigation of Driving Principle of Non-Electrically Driven Robots Using Sound	1261
	Waves as a Power Source	
	Shinichi Otake, Mitsuharu Matsumoto	
	Design and Dynamics Simulation of a Triphibious Robot in Webots Environment	1268
	Xiaoyi Gu, Anwei Zhang, Li Yuan, Yuanhao Xia	
	A Path Planning Method for the Spherical Amphibious Robot Based on Improved	1274
	A-star Algorithm Violation Color Violation Co	
	Jian Guo, Xiaojie Huo, Shuxiang Guo, Jigang Xu	
TP1-4	Human-System Interaction and Interface	
	Preliminary Evaluation of a Performance-based Stiffness Control for Upper Limb	1280
	Elbow Joints Rehabilitation	
	Ziyi Yang, Shuxiang Guo, Yi Liu	
	A Behavior Study on the Effect of Baby Schema on Face Discrimination for Robot	1286
	Appearance Design	
	Lichang Yao, Qi Dai, Yiyang Yu, Yuki Nishioka, Qiong Wu, Mengni Zhou, Jiajia Yang,	
	Satoshi Takahashi, Yoshimichi Ejima, Jinglong Wu	
	A Basic Psychophysics Study of Visual Masking Effect on Kanji Recognition for	1292
	Image Recognition Technology Qi Dai, Lichang Yao, Ikue Hattori, Qiong Wu, Jiajia Yang, Satoshi Takahashi,	
	Yoshimichi Ejima, Jinglong Wu	
		1200
	A Basic Psychophysics Study of Sound Reliability Effects on Audiovisual Integration	1298

	for Developing New Virtual Reality Device Hongtao Yu, Qiong Wu, Mengni Zhou, Qi Li, Jiajia Yang, Satoshi Takahashi, Yoshimichi Ejima, Jinglong Wu	
	Design of the Lower Limb Rehabilitation Training System Based on Virtual Reality Jian Guo, Kai Zhao, Shuxiang Guo	1304
	Design of Front Feed PID Control System for the Limb Rehabilitation Robot based on BP Neural Network Jian Guo, Fudong Huo, Shuxiang Guo	1310
TP2-4	Medical, Biomedical and Rehabiitation Systems	
	Proposal of Classification Table for Transfer Assistance Based on Condition of Care-Receiver Chiharu Ishii, Ryo Sugiyama	1316
	Design a Novel of Path Planning Method for the Vascular Interventional Surgery Robot based on DWA Model Jian Guo, Han Zhao, Shuxiang Guo	1322
	A Training System for Vascular Interventional Surgeons based on Local Path Planning Jian Guo, Yue Sun, Shuxiang Guo	1328
	Development of a Novel Intraoperative Information Monitor System for the Vascular Interventional Surgery Robotic System Wei Zhou, Shuxiang Guo, Zhengyang Chen, Fanxu Meng	1334
	Prediction of Physiological Tremor Based on Deep Learning for Vascular Interventional Surgery Robot Liuqing Zhang, Shuxiang Guo, Cheng Yang	1339
	Performance Evaluation of the Vascular Model Based on the Nonlinear Viscoelastic Tensor-Mass Method Zhengyang Chen, Shuxiang Guo, Wei Zhou, Fanxu Meng	1345
TA1-5	Industrial, Manufacturing Process and Automation	
	A CMOS Soil Yeast Count to Frequency Converter for Sensing Yeast Count Applications Cheng-Ta Chiang, Chung-Yu Hsu, Yao-Chieh Huang	1351
	Error Analysis of Vertical Beam Inclination of Delta-Robot Three-Dimensional Printers Yuezong Wang, Youfan Peng, Jigiang Chen, Yangyang Lu	1356

	Research on Nonlinear Ultrasonic Testing Technology of Microcracks in Metallic	1362
	<u>Materials</u>	
	Qinxue Pan, Shuangyang Li, Lang Xu, Yunmiao Zhang, Meile Chang, Xiaoyu Xu, Sa	
	Li, Wei Li	
	Economic Dispatch of Microgrid Based on Adaptive Mutation Particle Swarm	1368
	<u>Optimization</u>	
	Ji Li, Wenlong Nie, Xiaoning Xu, Lei Shao, Wentao Sun	
	Design of Remote Control Inverter Based on MQTT Communication Protocol	1374
	Kunpeng Yang, Baofeng Zhang, Jinwei Zhang, Junchao Zhu	
	Spacecraft Equipment Health Condition Monitoring Based on Augmented	1379
	Dickey-Fuller Test and Gaussian Mixture Model	
	Fusheng Zhang, Yang Zhao, Shumei Zhang, Wentao Wu, Chao Tan	
TA2-5	Elements, Structures, and Mechanisms	
	Heel Brake for Personal Mobility Vehicle	1385
	Shizuki Kawauchi, Isaku Nagai, Keigo Watanabe	
	Evaluation of Resonant Tank Topologies for High-Voltage Power Supply in Ion	1390
	Propulsion Application	
	Minghai Dong, Hui Li, Shan Yin, Zhenni Zeng, Jinshu Lin, Xi Liu, Yingzhe Wu	
	A Bio-Inspired Quadruped Robot with Foldable Torso Capable of Omnidirectional	1396
	<u>Motion</u>	
	Zhe Wang, Yixiang Liu, Qing Bi, Bin Yang, Rui Song	
	A Study of Ship Supportability Evaluation Using AHP and DS Evidence Theory	1402
	Ling Xiong, Peng Shang, Jiale Tian, Jian Zhou	
TP1-5	Intelligent Biomedical Instrument Technology	
	Design of Temperature Measurement Identification Instrument based on OpenMV	1407
	and MLX90614	
	Xin Wang, Yuanshuang Yang, Zixuan Zhang, Yuechang Luo, Zepeng Li	
	Motor Fault Diagnosis System Based on Single Chip Microcomputer and Artificial	1413
	<u>Intelligence</u>	
	Mengfu Hao, Xin Wang, Peiyu Li, Fan He, Liu Yang, Meng Xiao, Xueqi Bian, Zixuan	
	Zhang	
	A Novel Target Tracking System for the Amphibious Robot based on Improved	1419
	Camshift Algorithm	

	Shuxiang Guo, Handong Cheng, Jian Guo, Jigang Xu	
	A Novel Surgeon Training System for the Vascular Interventional Surgery based on	1425
	Augmented Reality	
	Jian Guo, Shichen Jia, Shuxiang Guo	
TA1-6	Robot Navigation and Control Algorithm	
	Searching Algorithm for Autonomous Distributed Agents based on Chemotactic Behavior of C. elegans	1431
	Takuto Yanagisawa, Yuya Hattori, Daisuke Kurabayashi	
	Performance Evaluation of the Assembly Mechanism for Multimodule Capsule Robots Docking Lingling Zheng, Shuxiang Guo	1437
	Distributed Leader-Follower Formation Control of Quadrotors Swarm Subjected to Disturbances	1442
	Omar Mechali, Jamshed Iqbal, Jingxiang Wang, Xiaomei Xie, Limei Xu	
	Consensus Based Distributive Task Allocation for Multi-AUV in Searching and Detecting Di Wu, Liukun Zhang, Lichao Hao	1448
	A Path Planning Algorithm based on Artificial Potential Field Method and Ant Colony	1454
	Algorithm Zheping Yan, Liyuan Jiang, Di Wu	
	Water Surface Targets Recognition and Tracking Based on Improved YOLO and KCF Algorithms	1460
	Zhongli Ma, Yaohan Zeng, Lili Wu, Linshuai Zhang, Jiadi Li, Huixin Li	
TA2-6	Organized session: Soft Robotics	
	Development of Pneumatic Driven Robot System Which Can Entry and Retire from Gas Pipe Satoshi Kodama, Yoka Konishi, Koki Shindo, Shotaro Senzaki, Toko Nakamura,	1466
	Yasuhiko Ohnuki, Minoru Konno, Hiroyuki Isii, Atsuo Takanishi	
	A Robot Finger with Many Joints Driven by One Motor Using Shape Memory Gel and Tendon-Driven Mechanism	1472
	Mitsuhiro Yamano, Naoya Hanabata, Akira Okamoto, Toshihiko Yasuda, Yasutaka Nishioka, MD Nahin Islam Shiblee, Kazunari Yoshida, Hidemitsu Furukawa, Riichiro Tadakuma	

Development of a Wrist Sphygmomanometer with an Active Soft Mechanism	1478
Nobuaki Yoshimura, Yasutaka Nishioka, Toshihiko Yasuda, Mitsuhiro Yamano,	
Minoru Taniguchi, Tuyoshi Hamaguchi, Chisato Uesaka, Masao Shimizu	
Prototype of the Assist System for Early Stage of Standing Up with a Pneumatic	1484
<u>Actuator</u>	
Ryuta Takemon, Toshihiko Yasuda, Yasutaka Nishioka, Mitsuhiro Yamano	