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	Shuxiang Guo, Changqi Xu, Nan Xiao, Xianqiang Bao, Yan Zhao, Cheng Yang, Rui Shen	
	Fuzzy CMAC Compound Control of Hydraulic Servo Actuation for Ship Steering System	1792
	Jiang'ao Zhao, Yongling Fu, Jian Fu, Guancheng Liu	
	Stress Level Evaluation Using BP Neural Network Based on Time-Frequency Analysis of HRV	1798
	Zhaoyi Qin, Min Li, Longping Huang, Yihan Zhao	
	Optimal UAVs Formation Transformation Strategy based on Task Assignment and Particle Swarm Optimization	1804
	Zezhi Sui, Zhiqiang Pu, Jianqiang Yi	
	Learning Human Motion Intention with 3D Convolutional Neural Network Joshua Owoyemi, Koichi Hashimoto	1810
	An Online Data Driven Fault Detection Method in Dynamic Process based on Sparse Representation	1816
	Rui Yang, Mengjie Huang	
WA2-3	Intelligent Control	
	Decentralized Force/Position Control for Reconfigurable modular robot based on the	1821
	Nonlinear Joint Torque Observer Wei Zhang, Yanli Du	
	Model Predictive Controller Design with Disturbance Observer for Path Following of Unmanned Surface Vessel	1827
	Zhilin Liu, Chao Geng, Jun Zhang	
	Design and Implement of a Low Cost Control System of Active Magnetic Bearings Using LabVIEW Interface for Arduino	1833
	Tingchen Du, Haipeng Geng, Yanhua Sun, Hao Lin, Hao Lv, Lie Yu	
	Characterization of Diamond Turned Sinusoidal Grid Surfaces Based on 2D-DFT	1838
	Xiaohui Wang, Wenzhen Zhong, Haiyan Shao	
	Time-optimal and Minimum-Jerk Trajectory Planning of 3-DOF PM Spherical Motor	1843
	Dengquan Zhang, Fengying Wu, Rui Li	
	<u>Combined improved Frequency-Tuned with GMM algorithm for moving target detection</u> Wang Hui, Gao Jing, Yu Lijun, Hu Yukun, Wang Zhengan	1848

WA1-4 Modeling, Simulation Techniques and Methodologies (V)

	Analysis of the Elastic Stress for the Bifurcated Region of Blood Vessel	1853
	Shuxiang Guo, Wenxuan Du, Jian Guo, Yuhang Cheng, Xiaoliang Jin	
	Compliant Control of a Space Robot with Multi Arms for Capturing Large Tumbling Target	1859
	Jiayu Liu, Qiang Huang, Tao Yang, Tao Deng	
	An Efficient Method for Neuronal Tracking in Electron Microscopy Images	1865
	Lei Yin, Chi Xiao, Qiwei Xie, Xi Chen, Lijun Shen, Hua Han	
	Dynamic positioning particle filtering method based on the EnKF	1871
	Xiaogong Lin, Hanyu Sun, Yuanhui Wang	
	Convolutional Neural Networks for Chinese Sentiment Classification of Social Network	1877
	Jia He, Maoyang Zou, Ping Liu	
	Design of an Upper-body Humanoid Robot Platform	1882
	Fenglei Ni, Chuangqiang Guo, Yiwei Liu, Minghe Jin, Hong Liu, Zijian Zhang	
WA2-4	Actuator Design, and Novel Actuator Systems	
	Development of Soft Mechanisms with a Pleated ELSA for Robots Contacting with Humans	1888
	Yasutaka Nishioka, Kazuyuki Nagao, Shun Yasuda, Toshihiko Yasuda, Mitsuhiro Yamano	
	Fault Tolerant Control Strategy Based on Actuation Switch Mechanism for More-electric	1894
	Aircraft with Vertical Tail Damage	
	Zhihan Zhou, Shaoping Wang, Xingjian Wang	
	Hamilton Jacobi Inequality Based Sliding Mode Robust Control for Optimal Torque	1900
	Transmissions of Dry Dual Clutch Assembly in Torque Phase of Shift	
	Mingxiang Wu	
	Numerical Simulation of Heat Transfer Distribution over the Surface of Internally Cooled	1906
	Nozzle Guide Vane in an Annular Cascade	
	Yulin Ding, Youhong Liu, Junjie Niu	
	Design and Performance Analysis of a Dual-Variable Electrohydrostatic Actuator for	1912
	Aerospace Application	
	Mingkang Wang, Yongling Fu, Jian Fu, Xu Han, Liming Yu	
	A Novel Multi-state Reliability Assessment Model for Servo HA/EHA System via Universal	1918
	Generating Function	
	Kangle Wang, Shaoping Wang, Jian Shi	
WA1-5	Mobile Robot System (III)	
	An Integrated Exploration and Observation Planning for an Efficient Indoor 3D Mapping	1924

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	An Improved Multi-AUV Patrol Path Planning Method	1930
	Zheping Yan, Jingwen He, Juan Li	
	Real-Time RGB-D based People Detection and Tracking System for Mobile Robots	1937
	Fang Fang, Kun Qian, Bo Zhou, Xudong Ma	
	Adaptive Square-Root CKF based SLAM Algorithm for Indoor UGVs	1942
	Jianzhong Xia, Umar Iqbal, Aboelmagd Noureldin, Mahamed Maher Atia, Feng Sun	
	The field terrain recognition based on extreme learning machine using wavelet features	1947
	Caixia Liu, Jianjun Fang, Yanxia Liu, Yujiao Lu	
	Fuzzy-Tuned PI Controller for Plate Balancing on a Mobile Vehicle System	1952
	Yongyut Pattanapong, Chirdpong Deelertpaiboon	
WA2-5	Rescue Robots and Field Robot Systems	
	Experimental Evaluating Approach to a Suitable Martian Coaxial Rotorcraft Blade	1958
	Qiquan Quan, Pengyue Zhao, Shuitian Chen, Dan Wang, He Li, Deen Bai, Zongquan Deng	
	Basic Study on Wall Climbing Root with Magnetic Passive Wheels	1964
	Hidenori Ishihara	
	Estimation of Center of Gravity for Withdrawal Works of Unknown Indefinite Shape Rubbles	1970
	for Rescue Robots	
	Masatoshi Hatano	
	Crawling Motion and Foot Trajectory Modification Control for Legged Robot on Rough Terrain	1976
	Takashi Matsuzawa, Ayanori Koizumi, Kenji Hashimoto, Xiao Sun, Shinya Hamamoto,	
	Tomotaka Teramachi, Nobuaki Sakai, Shunsuke Kimura, Atsuo Takanishi	
	Effect of Robot Operation by a Camera with the Eye Tracking Control	1983
	Masahiko Minamoto, Yutaro Suzuki, Takahiro Kanno, Kenji Kawashima	
	Design of an Adjustable Pipeline Inspection Robot with Three Belt Driven Mechanical Modules	1989
	Chung-Wei Ou, Chin-Jung Chao, Fa-Shian Chang, Shun-Min Wang, Jeng-Nan Lee, Ren-De	
	Hung, Bin Chiu, Kai-Yi Cho, Lih-Tyng Hwang	
WA1-6	Micro and Nano Systems	
	A Charge-Amplifier Based Self-Sensing Method for Measurement of Piezoelectric	1995
	Displacement	
	Zhangming Du, Tianlu Zhang, Lu Deng, Chao Zhou, Zhiqiang Cao, Shuo Wang	
	Motion Performance Evaluation of a Magnetic Actuated Screw Jet Microrobot	2000

Shuxiang Guo, Zixu Wang, Qiang Fu

	On-Chip RBC Deformability Checker Embedded with Vision Analyzer	2005
	Makoto Kaneko, Takuto Ishida, Chia-Hung Dylan Tsai, Hiroaki Ito, Misato Chimura, Tatsunori	
	Taniguchi, Tomohito Ohtani, Yasushi Sakata	
	The Reference Plane by BEMD for 3D Roughness Evaluation of Micro-milling Surface	2011
	Yun Qi, Jinkai Xu, Zhanjiang Yu, Huadong Yu	
	Vision-based Quality Inspection for Components with Small Diameter and Deep Hole	2016
	Xinyi Gong, Hu Su, Zhengtao Zhang, De Xu	
	Development of the 3D measurement system in real-time for micro-manipulation	2022
	Kenichi Ohara, Masaru Kojima, Shota Takagi, Mitsuhiro Horade, Yasushi Mae, Tatsuo Arai	
WA2-6	CAD/CAM/CAE and Manufacturing Systems	
	Development of Low Cost Programmable Indexing Head for Horizontal Milling Machine	2028
	Sanjiv Kumar, Deepam Goyal, S. S. Banwait	
	Design and Simulation of Gas Turbine Blade Fatigue Testing Rig Driven by Electric Magnet	2034
	Haipeng Geng, Xifeng Zhou, Baisong Yang, Wenjie Cheng, Lie Yu, Xueyun Liu, Yu Fang	
	Research on algorithm of tool-path planning for 5-axis NC machining based on double	2039
	quaternion	
	Jian Wang, Qiang Liu, Shiwei Pi, Qitong Liu, Yao Li	
	The Simulation Analysis of Fluid Internal Characteristics of Wet Clutch During the Engaging	2045
	Process	
	Liying Miao, Xuesong Li, Xiusheng Cheng, Rong Chen	
	B-spline Smooth Compression of Consecutive Micro Segment Trajectories in Free-form	2051
	Surface NC Machining	
	Qitong Liu, Qiang Liu, Shiwei Pi, Jian Wang, Pengpeng Sun	
	Automatic generation and optimization of stable assembly sequence based on ACO algorithm	2057
	Weijun Huang, Qinchao Xu	