

2016 World Automation Congress (WAC 2016)

**Rio Grande, Puerto Rico
31 July – 4 August 2016**



IEEE Catalog Number: CFP16518-POD
ISBN: 978-1-5090-1895-6

**Copyright © 2016, TSI Enterprise Inc. (TSI Press)
All Rights Reserved**

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

IEEE Catalog Number:	CFP16518-POD
ISBN (Print-On-Demand):	978-1-5090-1895-6
ISBN (Online):	978-1-889335-51-3
ISSN:	2154-4824

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

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Automatic Person Authentication Using Fewer Channel EEG Motor Imagery 123

Orlando Nieves and Vidya Manian

Biodiversity Assessment in Coral Reef Benthic Habitats Using Hyperspectral Images 129

Alejandro Sotomayor, Jesus Vidal, Ollantay Medina and Vidya Manian

A Hierarchical Semantic Memory Model for Classification of Motion Capture Data 135

Ollantay Medina and Vidya Manian

Frequency Domain Analysis of Super Resolution Image Reconstruction and Super Resolution with Nonlinear Processing 141

Seiichi Gohshi

Toward High Available SDN/NFV-based Virtual Network Service in Multi-Providers Scenario 147

Shibo Luo, Kaoru Ota, Mianxiong Dong, Jun Wu, Jianhua Li and Bei Pei

Fall Stimulation Method Based on Differential Velocity of Split Belt Treadmill 152

Yasutaka Nakashima, Takanori Fukui and Motoji Yamamoto

RCD: Rapid Close to Deadline Scheduling for Datacenter Networks 158

Mohammad Noormohammadpour, Cauligi Raghavendra, Sriram Rao and Asad M Madni

Medical Robotics For Pediatric Applications: Shoulder Arthrography, Ankle Rehabilitation, and Temporal Bone Surgery 164

Kevin Cleary

Brain Wave Measurement while Touching Task of a Virtual Arm for Intuitive Robotic Surgery 169

Satoshi Miura, Junichi Takazawa, Kazuya Kawamura, Yo Koabayashi, Tomoyuki Miyashita and Masakatsu Fujie

Controller Design for a Trunk Rotation Assist Device for Passive Dynamic Walking 175

Takuma Aizu, Takayuki Tanaka, Takashi Kusaka and Kotaro Hashimoto

Prototype of a Trunk Rotation Assist System for Passive Dynamic Walking and Fundamental Experiments 181

Kotaro Hashimoto, Takayuki Tanaka, Takashi Kusaka and Takuma Aizu

Situation Awareness and Mental Workload of Navigator in Ship Maneuvering Simulator 187

Tadatsugi Okazaki, Chihiro Nishizaki and Koji Murai

Automatic EEG Processing for the Early Diagnosis of Traumatic Brain Injury 193

Bruno Albert, Alex Noyvirt, Rossitza Setchi, Haldor Sjaheim and Frode Strisland

Content Driven Generation of RFLP Structured Engineering System Representation 199

László Horváth and Imre J Rudas

Consideration of the experiences of blind people using four user interfaces for editing of tactile graphics 205

Noboru Takagi and Mingze Li

Improving Visibility of A Fast Dehazing Method 209

Zhi Wang, Daishi Watabe and Cao Jianting

Wrist Joint Angle Estimation by Means of Muscle Bulge Based on Deformation of the Forearm Skin Surface 215

Akira Kato, Yuya Matsumoto, Yo Koabayashi, Shigeki Sugano and Masakatsu Fujie

Evaluation of a device that promotes walking using a two-dimensional emotion map 221

Eiichirou Tanaka, Yusuke Osawa, Keiichi Muramatsu, Keiichi Watanuki, Shozo Saegusa and Louis Yuge

Model-based resilient control for a multi-agent system against Denial of Service attacks 226

Esther Amullen, Sachin Shetty and Lee-Hyun Kee

Using Performance Maps to Build a Real Time Decision Making Framework 232

Hilgad Montelo and Delbert Tesar

Distributed Control for Multiple Quadrotors with Obstacle Avoidance Using Potential Fields 237

Luis F. Luque-Vega, Luis Enrique González-Jiménez, David Fernandez-Flores, Bernardino Castillo-Toledo, Antonio Ramirez Trevino and Jawhar Ghommam

Fuzzy Modeling of Drivers' Actions at Intersections 243

Saina Ramyar, Abdollah Homaifar, Allan Anzagira, Ali Karimodini, Arda Kurt and Seifemichael Amsalu

Layered robotic system safety with lessons learned from automatic pedestrian doors 249

Richard Hooper and Dave Savage

Mechatronics Course Projects for Use in Simulation Center 255

Daniel J Cox

A Study on Gaze Estimation System using the Direction of Eyes and Face 260

Keiko Sakurai, Mingmin Yan, Hiroki Tamura and Koichi Tanno

Sustainable Manufacturing based Manufacturing Process Flow Improvement and Simulation 266

Michael Packianather

A non-iterative LMI based PID power system stabilizer 272

M. Foad Samadi, Mehrdad Saif, Maryam Dehghani and Mojtaba Kordestani

Evaluation of Mental Workload of Sea Pilot and Captain Using Salivary NO3- 278

Kenichi Kitamura, Koji Murai and Shin-ichi Wakida

Real-Time Single Channel EEG Motor Imagery based Brain Computer Interface 283

Jaime Camacho and Vidya Manian

Hypercube Based Clusters in Cloud Computing 289

Amin Sahba and John J Prevost

Wearable Assistive Device for Physical Load Reduction of Caregiver 295

Yasuhisa Hasegawa, Takashi Hoshino and Atsushi Tsukahara

Robustness of Discrete-Time Inverse Optimal Control for Trajectory Tracking 301

Enrique Lastire Olmedo, Edgar N. Sanchez, Alma Y. Alanis and Fernando Ornelas-Tellez

State and Unknown Input Disturbance Estimation for Positive Linear Systems 307

Bahram Shafai, Sam Nazari and Amirreza Oghbaee

Positive Stabilization of Linear Continuous-Time Singular Systems 313

Bahram Shafai and Cheng Li

Effective action selection under multi task by ignoring tasks and limiting tasks 320

Takuya Masaki and Kentarou Kurashige

Toward Development of Monitoring System of Port Coordinator's Mental Workload Using Adhesive Plaster-type Sensor 326

Koji Murai, Kenichi Kitamura, Takayuki Fujita, Kazusuke Maenaka and Kohei Higuchi

Application of Artificial Metaplasticity Fundamentals to WBCD Breast Cancer Database Classification Method 331

Juan Fombellida Vetas, Irene Martin-Rubio and Diego Andina

Hardware Realization of A dq Based Fault Detection Scheme for 3 ϕ Four-Leg Inverter 336

Mohammad Reza Eskandari, Arash Ahmadi, M. Foad Samadi and Mehrdad Saif

Intelligent control for the exciter of a synchronous machine with closed loop voltage 342

Oscar Javier Suarez, Aldo Pardo and Edgar N. Sanchez

Induction Motor Torque Control via Discrete-Time Sliding Mode 348

Eduardo Quintero, Edgar N. Sanchez and Ramón Antonio Félix

A study on the extraction of factors for ship collisions using the MLD method 353

Nobuo Mitomo, Hiro Masuyama, Atsushi Hashimoto and Yukitaka Nagai

Application of Big Data Analytics via Cloud Computing 358

Yunus Yetis, Ruthvik Sara, Berat Alper Erol, Halid Kaplan, Abdurrahman Akuzum and Mo Jamshidi

Instability of Systems to Control Upright Posture on Gentle Slopes 363

Masumi Takada, Akira Masegi, Yuta Fukui and Hiroki Takada

Analytical Study and Enhancements for Patrolling Operations based on Dubins' Traveling Salesman Problem 369

Walaaeldin Ghadiry, Jalal Habibi, Amir Aghdam and Youmin Zhang

Complements: Biotechnology and Technobiology 375

James Tien and Pascal Goldschmidt

Obstacle detection and avoidance module for the blind 382

Paulo Costa, Hugo Fernandes, João Barroso, Hugo Paredes and Leontios Hadjileontiadis

Real-time Optimal Tracking Control for a Three-phase Inverter 388

Reynaldo Diaz-Sepulveda, Fernando Ornelas-Tellez and Edgar N. Sanchez

Image Enhancement With Weighted Histogram Equalization and Heap Transforms 393

Mehdi Hajinorozi, Artyom M Grigoryan and Sos Agaian

3D Printed Underwater Housing 399

Patrick J Benavidez, Benjamin Champion, Mo Jamshidi and Matthew Joordens

Integrating Climate Change Actions with OEE and SOX Compliance 405

Kokchu Tham and Asad M Madni

Smart Tractors in Pistachio Orchards Equipped with RFID 411

Farshid Sahba and Zahra Nourani

Formation Control Implementation Using Kobuki TurtleBots and Parrot Bebop Drone 417

Nicolas Gallardo, Karthik Haradi, Berat Alper Erol, Patrick J Benavidez, Mo Jamshidi, Benjamin Champion and Nicholas Gamez

Mobile Manipulator Dual-Trajectory Tracking Using Control Variables Introduced to End-Effector Task Vector 423

Mustafa Mashali, Redwan Alqasemi and Rajiv Dubey

Business Intelligence: New products development and supply chain systems in a SoSE perspective 429

Irene Martin-Rubio, Ana Tarquis and Diego Andina

Cloud-based Control and vSLAM through Cooperative Mapping and Localization 434

Berat Alper Erol, Satish Vaishnav, Joaquin Labrado, Patrick J Benavidez and Mo Jamshidi

Fault Tolerance and Low Power circuit design of Back Propagation Neural Networks 440

Nagalingam Rajeswaran and Tenneti Madhu

Skin-Propagated Vibration for Roughness and Textures 444

Makiko Natsume, Yoshihiro Tanaka and Akihito Sano

Reliability-based Optimization aimed for Task Allocation in Heterogeneous Distributed Computing Systems 450

Khalil Shujaee, Roy George and Zeynab Bahrami-Bidoni

Hierarchical Model Predictive Control in Fusion Reactors 456

Izaskun Garrido, Stefano Coda, Le Hoang Bao, Jean Marc Moret, Vicente Manuel Queral, Maria Sevillano and Aitor J Garrido

Development of a Micro Aerial Vehicle 462

Mohammadreza Behniapoor, Zhuoning Yuan, Abel Hailemichael, Vinh K, Brittney Bowles, Ali Karimoddini and Abdollah Homaifar

A Recognition Method for Partially Overlapped Objects 468

Takaaki Oka and Masakazu Morimoto

Large-scale Virtual Reality Micro-robotic Cell Injection Training 472

Syafizwan Faroque, Ben Horan, Michael Mortimer and Mulyoto Pangestu

The role of the feedforward loop into the information transmission 478

Jesús Rodríguez and Aarón Vázquez-Jiménez

Modeling of Oscillating Water Column Wave Energy Systems 483

Aitor J Garrido, Izaskun Garrido, J. Lekube, M. Delasen and E. Carrascal

Design and Control Architecture of a 3D Printed Modular Snake Robot 489

Ikram Mohammed, Benjamin Champion, Patrick J Benavidez, Nicolas Gallardo and Mo Jamshidi

Fatigue Level Estimation System based on Sole Pressure Analysis 495

Takahiro Takeda, Naoyuki Kubota and Yutaka Hata

Passive Muscle Force Analysis During Vehicle Access: A Gender Comparison 501

Darius Nahavandi, Mohammed M Hossny and Imali Hettiarachchi

Improving Vehicle Navigation by Heading-enabled ACO Approach 506

Chaomin Luo, Yamei Xiao, Simon Yang and Gene Eu Jan

Human Rehabilitation and Rehabilitation Orthotics/Assist 512

Delbert Tesar

***Autonomous Mobile Robot Platform with Multi-Variant Task-Specific End-Effector and Voice Activation* 518**

Jonathan Tapia, Eric Wineman, Patrick J Benavidez, Aldo Jaimes, Benjamin Champion, Ethan Cobb, John Parsi, Daniel Clifton and Mo Jamshidi

***Evolutionary Ensemble Learning of Fuzzy Randomized Neural Network for Posture Recognition* 524**

Takenori Obo, Naoyuki Kubota and Chu Kiong Loo

***Converter Design for Solar Powered Outdoor Mobile Robot* 530**

Josue Lambert, Patrick J Benavidez, Jacqueline Ortiz, Jack Richey, Shane Morris, Nicolas Gallardo and Mo Jamshidi

***Cloud Robotics: A Software Architecture For Heterogeneous Large-Scale Autonomous Robots* 536**

Seyed Ali Miraftebzadeh, Nicolas Gallardo, Nicholas Gamez, Karthik Haradi, Abhijith Ravikumar Puthussery, Paul Rad and Mo Jamshidi

***An Ultrasonic Evaluation System of Stem Fixation in Total Hip Arthroplasty* 542**

Kouki Nagamune and Kiyonori Mizuno

***The Diagnosis of Lumbar Disc Disorder by MR Image Processing and Data Mining* 546**

Mina Yazdandoost and Farshid Sahba

***Exploiting Redundancy to Improve Bimanual Telepresent Manipulation* 550**

Kevin Wolfe, Michael Kutzer and Edward Tunstel

***An Integrated Type-2 Fuzzy Sliding Mode Control for Underactuated Surface Vessels* 556**

Yu Tian and Simon Yang

***Automatic segmentation of jaw from panoramic dental X-ray images using GVF snakes* 562**

Md Mosaddik Hasan, Waidah Ismail and Atsuo Yoshitaka

***An automated method for the nuclei and cytoplasm of Acute Myeloid Leukemia detection in blood smear images* 568**

Nhan Tran, Waidah Ismail and Atsuo Yoshitaka

***Combining Workers' Behavior Data and Real Time Simulator for a Cellular Manufacturing System* 574**

Masaki Kitazawa, Satoshi Takahashi, Toru Takahashi, Atsushi Yoshikawa and Takao Terano

***Modeling Decentralized Inter-Organizational Business Structures through Agent-Based Simulation* 580**

Taisei Mukai and Takao Terano

***Applying the Modified TLBO Algorithm to Solve the Unit Commitment Problem* 588**

Peyman Khazaei, Morteza Dabbaghjamesh, Ali Kalantarzadeh and Hasan Mousavi

Nodding Behavioral Context Respectful Counseling Agent 594

Yukiko Yamamoto, Tetsuo Shinozaki, Setsuo Tsuruta, Kentarou Kurashige and Rainer Knauf

IoT-aware online shopping system enhanced with Gaze Analysis 600

Yukiko Yamamoto, Takashi Kawabe, Setsuo Tsuruta, Ernesto Damiani, Atsuo Yoshitaka, Yoshiyuki Mizuno and Rainer Knauf

Solar Flare Prediction by SVM integrated CBGA with dynamic mutation rate 606

Yukiko Yamamoto, Daichi Itoh, Setsuo Tsuruta, Takayuki Muranushi, Syoji Kobashi, Yuko Hada-Muranushi, Yoshiyuki Mizuno and Rainer Knauf

Intelligent bypass method exploiting VPN for stable offshore business on the Internet 613

Hiroshi Fujikawa, Hirofumi Yamaki, Yukiko Yamamoto and Setsuo Tsuruta

Equipping a Context Respectful Counseling Agent with a Human-like Voice Synthesizer 620

Yukiko Yamamoto, Tetsuo Shinozaki, Setsuo Tsuruta, Ernesto Damiani and Rainer Knauf

Brief evaluation of the membrane and metabolic characteristics of heat-injured yeast with dielectrophoretic velocimetry 626

Satoshi Uchida, Takahiro Ishida and Fumiyoshi Tochikubo

Circulating Tumor Cells - A novel Detection System with "Universal" CTC-chip 631

Kazue Yoneda and Fumihiro Tanaka

Towards single-cell genome analysis of circulating tumor cells based on microcavity array 635

Tomoko Yoshino and Tsuyoshi Tanaka

Development of Microwell Array for Dielectric Characterization of Circulating Tumor Cells 641

Masanori Eguchi, Hiroko Imasato, Futoshi Kuroki and Takeshi Yamakawa

Optimization of RDF reasoning based on MapReduce 81

Niu Qin-zhou and Zheng Yu-di

A Heterogeneous Multiprocessor Task Scheduling Algorithm Based on SFLA 41

Deng Yun and Cheng Xiao-hui

Data Resource Semantic Support Method Research based on Meta-data Annotation 46

Ke Xu and Hongming Cai

Application of OpenStack in Chinese Spallation Neutron Source Computing System 52

Yakang Li, Fazhi Qi, Yanming Wang, Jianshu Hong and Yulin Zhao

An Indoor Positioning Algorithm Based on Geometry and RSS Clustering 57

Jianye Peng, Taoshen Li, Zhihui Ge, and Kai Zhou

An Efficient XML Label based on MapReduce 63

Bowen Wei, Kunfang Song, Minghua Jiang

An Evaluation Model for Information Security of Android Application Based on Analytic Hierarchy Process 69

Wan Yan, Wang Guolin, and Feng Xiangyang

A Data-driven Mechanism for Large-scale Data Distribution 75

Shi Peichang, Li Yiyang, Ding Bo, and Zhang Jie

Research on Virtual Machine Placement in the Cloud Based on Improved Simulated Annealing Algorithm 89

Nan Su, Aiwu Shi, Changnian Chen, E Chen and Yuxuan Wang

PMIPv6-based Partially Distributed Mobility Management Modeling and Evaluation 100

Ye Wang

A Survey on Evaluating Elasticity of Cloud Computing Platform 107

Yazhou Hu, Bo Deng, Fuyang Peng, Bin Hong, Yuchao Zhang and Dongxia Wang

A Improved Sequential Pattern Mining Algorithm Based on PrefixSpan 119

Xue Fei and Shan Zheng, Yan Li-jing and Fan Chao

Enhancement of Image Edge Definition by modified Quadtree sobel operator 86

He Weigang, Zhang Fan, Li Zhenglin, and Li Shuyuan

Study of Improved Multiple Signal Classification Algorithm Based On Coherent Signal Sources 96

He Weigang, Zhang Fan, Li Zhenglin, and Li Shuyuan

Vehicle Scheduling base on the Improved Particle Swarm 111

Xueying Zhang, Xianghan Zheng, and Huijuan Ye Xueying Zhang, Xianghan Zheng, and Huijuan Ye

Combat Decision-Making in Cloud War Based on Neural Networks 115

Long Wang and Hu Liu

Evolution of Wireless Sensor Network Security 1

Yang Xiaomei and Ma Ke

Analysis and Design of Video-Based Activity Identification and Classification System in Agricultural Industry 16

Kai Ma, Dong Ren, Zhiyong Huang and Chuanheng Sun

A Novel Agent-based Intersection Control Method for Urban Traffic 22

Yong Zhu, Jiayi Duan, and Hongpeng Yin

Research on Design of Virtual Museum of Submerged Traditional Architectures in Three Gorges Reservoir Area 32

Zheng Xu, Tongsheng Pan¹, Ruizhi Zhang, Xiaonan Wang, and He Kang

Complexity Theory Analysis of Bridge Structure System 36

Jianxi Yang and Jinqiu Shu

Application Research on Design Ethics —the Feasibility Research of Interior Design for Parent-Child Communication 6

Ruizhi Zhang, Zheng Xu and Xiaonan Wang

Diagnosis of the bridge system damage based on multi-fractal 11

Jianxi Yang and Die Liu

Quick image processing method of HJ satellites applied in agriculture monitoring 27

Yu Haiyang, Liu Yanmei, Yang Guijun, and Yang Xiaodong