# 2015 12th International Conference on Informatics in Control, Automation and Robotics (ICINCO 2015)

Colmar, Alsace, France 21-23 July 2015

Volume 1 Pages 1-675



IEEE Catalog Number: CISBN: 97

CFP15NCO-POD 978-1-4673-6944-2

#### **Copyright © 2015, Science and Technology Publications (SCITEPRESS) 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: CFP15NCO-POD ISBN 13: 978-1-4673-6944-2

### **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@proceed
Web: www.proceeding curran@proceedings.com www.proceedings.com



### **CONTENTS**

### INVITED SPEAKERS

KEYNOTE SPEAKERS	
Formation Control and Vision based Localization of System of Mobile Robots Krzysztof Kozlowski	IS-5
Controlled Magnetic Bearings for Smart Machines Gerhard Schweitzer	IS-7
$\label{thm:mobile Manipulation - Why Are Humans so Much Better? And How Can We Change That? \\ \textit{Oliver Brock}$	IS-9
Rough Terrain Mobile Robotics - From Design to Motion Control and Planning $F\!a\ddot{z}BenAmar$	IS-11
INTELLIGENT CONTROL SYSTEMS AND OPTIMIZATION	
FULL PAPERS	
Implementation of Evolving Fuzzy Models of a Nonlinear Process Radu-Emil Precup, Emil-Ioan Voisan, Emil M. Petriu, Mircea-Bogdan Radac and Lucian-Ovidiu Fedorovici	5
Adaptive Decision-level Fusion for Fongbe Phoneme Classification using Fuzzy Logic and Deep Belief Networks Frejus A. A. Laleye, Eugene C. Ezin and Cina Motamed	15
Application of Sensory Body Schemas to Path Planning for Micro Air Vehicles (MAVs) Eniko T. Enikov and Juan-Antonio Escareno	25
Genetic Algorithm based X-Ray Diffraction Analysis for Chemical Control of Aluminium Smelters Baths Shakhnaz Akhmedova, Igor Yakimov, Aleksandr Zaloga, Sergey Burakov, Eugene Semenkin, Petr Dubinin, Oksana Piksina and Eugene Andryushenko	32
SHORT PAPERS	
Robot Navigation using Velocity Potential Fields and Particle Filters for Obstacle Avoidance Dan-Sorin Necsulescu, Jin Bai and Jurek Sasiadek	43
Optimal Irrigation Scheduling and Crop Production Functions Development using AquaCrop and TOMLAB Ilya Ioslovich and Raphael Linker	49
Two-player Ad hoc Output-feedback Cumulant Game Control Chukwuemeka Aduba and Chang-Hee Won	53
The Design of the 3-Axial Centrifuge Feng Ou, Ying Chen, Hong Chen and Dongfeng Zhang	60
A Fault Detection Scheme for Time-delay Systems using Minimum-order Functional Observers H. M. Tran and H. Trinh	

Particle Swarm Optimization of Economic Dispatch Problem: A Brief Review Transfer Elahe Faghihnia, Sadegh Khaleghi, Reihane Kardehi Moghaddam and Mahdi Zarif	72
$\label{thm:condition} \mbox{Identifying Landmark Cues with LIDAR Laser Scanner Data Taken from Multiple Viewpoints} \\ And rzej \mbox{\it Bieszczad}$	78
Design of State Observers for Interconnected Time-delay Systems via a Coordinate Transformation Approach Wei Yin Leong and Hieu Trinh	86
Diversifying TS using GA in Multi-agent System for Solving Flexible Job Shop Problem Ameni Azzouz, Meriem Ennigrou and Boutheina Jlifi	94
A Novel Approach to Neural Network Design for Natural Language Call Routing Roman Sergienko, Oleg Akhtiamov, Eugene Semenkin and Alexander Schmitt	102
PI-controlled ANN-based Energy Consumption Forecasting for Smart Grids Gulsum Gezer, Gurkan Tuna, Dimitris Kogias, Kayhan Gulez and V. Cagri Gungor	110
Norm Selection for Evaluation Criterion for Placement Planning of Active Damping Devices in Structure  Kou Miyamoto, Jinhua She, Hiroshi Hashimoto and Min Wu	117
Cooperative Self-optimisation of Network Protocol Parameters at Runtime Sven Tomforde, Jan Kantert, Sebastian von Mammen and Jörg Hähner	123
Mobile Sensor Path Planning for Iceberg Monitoring using a MILP Framework Anders Albert and Lars Imsland	131
A Multi-sensory Stimuli Computation Method for Complex Robot Behavior Generation Younes Raoui and El Houssine Bouyakhf	139
Study of Inheritance and Approximation Techniques for Adaptive Multi-objective Particle Swarm Optimization  Ibtissem Bouoni, Nadia Smairi and Kamel Zidi	146
A New Energetically Optimized Power Supply System for a Mobile Robot Platform, using Ultracapacitors and Batteries to Ensure Both Ultra-fast Charging and Autonomy Carlos Arantes, João Sena Esteves and João Sepúlveda	155
The Use an Electric Vehicle as a Power Source Kristyna Friedrischkova, David Vala and Bohumil Horak	164
Pitfalls When Solving Eigenproblems - With Applications in Control Engineering Vasile Sima and Peter Benner	171
Inverse Kinematics of a Redundant Manipulator based on Conformal Geometry using Geometric Approach  Je Seok Kim, Jin Han Jeong and Jahng Hyon Park	179
The Optimal Control Problems of Nonlinear Systems M. N. Kalimoldayev, M. T. Jenaliyev, A. A. Abdildayeva and L. S. Kopbosyn	186
Autonomous Cars: Past, Present and Future - A Review of the Developments in the Last Century, the Present Scenario and the Expected Future of Autonomous Vehicle Technology Keshav Bimbraw	191

MIMO Evolving Learning based on Maximum Likelihood Algorithm Applied to Black Box Fuzzy Modeling for Systems Identification Design Orlando Donato Rocha Filho and Ginalber Luiz de Oliveira Serra	199
Optimal Design of Digital Low Pass Finite Impulse Response Filter using Particle Swarm Optimization and Bat Algorithm  Alcemy G. V. Severino, Leandro L. S. Linhares and Fábio M. U. de Araújo	207
Modelling and Optimization of Strictly Hierarchical Manpower System  Andrej Škraba, Eugene Semenkin, Davorin Kofjac, Maria Semenkina, Anja Znidaršic, Matjaž Maletic, Shakhnaz Akhmedova, Crtomir Rozman and Vladimir Stanovov	215
A Proposal based on Frequency Response for Multi-Model Controllers Anderson Luiz de Oliveira Cavalcanti	223
Unconstrained Global Optimization: A Benchmark Comparison of Population-based Algorithms Maxim Sidorov, Eugene Semenkin and Wolfgang Minker	230
Can UAV and UGV Be Best Buddies? - Towards Heterogeneous Aerial-ground Cooperative Robot System for Complex Aerial Manipulation Tasks  Tamara Petrovic, Tomislav Haus, Barbara Arbanas, Matko Orsag and Stjepan Bogdan	238
Detecting and Isolating Inconsistently Behaving Agents using an Intelligent Control Loop Jan Kantert, Sarah Edenhofer, Sven Tomforde, Jörg Hähner and Christian Müller-Schloer	246
Neural Modeling and Control of a $^{13}\mathrm{C}$ Isotope Separation Process Vlad Muresan, Mihail Abrudean, Honoriu Valean, Tiberiu Coloși, Mihaela-Ligia Unguresan, Valentin Sita, Iulia Clitan and Daniel Moga	254
Addressing Challenges Beyond Classic Control with Organic Computing Jan Kantert, Sven Tomforde and Christian Müller-Schloer	264
Revisiting Gradient Methods in Function Space - With Application to Rocket Trajectories ${\it JosephZ.Ben-Asher}$	270
A New Inverse Optimal Control Method for Discrete-time Systems  Moayed Almobaied, Ibrahim Eksin and Mujde Guzelkaya	275
Consensus of Nonlinear Multi-Agent Systems with Exogenous Disturbances Xiaozhi Yu, Zhen He and Feng Yu	281
Option-based Motion Planning and ANFIS-based Tracking Control for Wheeled Robot in Cluttered Environment Yangyang Feng, Weiwei Yu, Yasheng Chen, Xiaoqun Tan, Runxiao Wang and Kurosh Madani	287
Integrating Particle Swarm Optimization with Analytical Nonlinear Model Predictive Control for Nonlinear Hybrid Systems  Jean Thomas	294
Periodic Takagi-Sugeno Observers for Individual Cylinder Spark Imbalance in Idle Speed Control Context  Thomas Laurain, Jimmy Lauber and Reinaldo Palhares	302
ANN-based Classifiers Automatically Generated by New Multi-objective Bionic Algorithm Shakhnaz Akhmedova and Eugene Semenkin	310
Temporal-Difference Learning - An Online Support Vector Regression Approach Hugo Tanzarella Teixeira and Celso Pascoli Bottura	318

Hybrid Algorithm for Solving the Multi-compartment Vehicle Routing Problem with Time Windows and Profit Hadhami Kaabi and Khaled Jabeur	324
A Diagnosis Scheme for Dynamical Systems: Approach by Guaranteed Parameter Estimation Qiaochu Li, Carine Jauberthie, Lilianne Denis-Vidal and Zohra Cherfi	330
Off-line State-dependent Parameter Models Identification using Simple Fixed Interval Smoothing Elvis Omar Jara Alegria, Hugo Tanzarella Teixeira and Celso Pascoli Bottura	336
State-parameter Dependency Estimation of Stochastic Time Series using Data Transformation and Parameterization by Support Vector Regression  Elvis Omar Jara Alegria, Hugo Tanzarella Teixeira and Celso Pascoli Bottura	342
SIGNAL PROCESSING, SENSORS, SYSTEMS MODELLING AND CONTROL	
FULL PAPERS	
Freezing Method Approach to an Asymptotic Stability of the Discrete-time Oscillator Equation Artur Babiarz, Adam Czornik and Michal Niezabitowski	353
Inferential Active Disturbance Rejection Control of a Distillation Column using Dynamic Principal Component Regression Models Fahad Al Kalbani and Jie Zhang	358
Comparison of Two Radar-based Scanning-techniques for the Use in Robotic Mapping Paul Fritsche and Bernardo Wagner	365
Trajectory Tracking Control of Robot Manipulators using Discrete Time-varying Pole Placement Technique Yasuhiko Mutoh, Masakatsu Kemmotsu and Lisa Awatsu	373
Bayesian Quadrature in Nonlinear Filtering  Jakub Prüher and Miroslav Šimandl	380
${\it LQG/LTR}\ {\it Versus}\ {\it Smith}\ {\it Predictor}\ {\it Control}\ {\it for}\ {\it Discrete-time}\ {\it Systems}\ {\it with}\ {\it Delay}\ {\it Dariusz}\ {\it Horla}\ {\it and}\ {\it Andrzej}\ {\it Krolikowski}$	388
Multiple Sensor Fusion using Adaptive Divided Difference Information Filter Aritro Dey, Smita Sadhu and Tapan Kumar Ghoshal	398
Sign Subband Adaptive Filter with Selection of Number of Subbands Jae Jin Jeong, Seung Hun Kim, Gyogwon Koo and Sang Woo Kim	407
Application of Sliding Mode Control to the Ball and Plate Problem David Debono and Marvin Bugeja	412
Coupling Analysis and Control of a Turboprop Engine C. Le Brun, E. Godoy, D. Beauvois, B. Liacu and R. Noguera	420
SHORT PAPERS	
A Comparison of Robust Model Predictive Control Techniques for a Continuous Bioreactor V. E. Ntampasi and O. I. Kosmidou	431
Experimental Modal Analysis based on a Gray-box Model of Flexible Structures  Alberto Cavallo, Giuseppe De Maria, Michele Iadevaia, Ciro Natale and Salvatore Pirozzi	439

Control Moment Gyros  Romulus Lungu, Mihai Lungu and Mihai Ioan	448
Gaussian Mixture Measurements for Very Long Range Tracking Qian Zhang and Taek Lyul Song	457
Discrete Sliding Mode Control for a VCM Positioning System  Kuo-Ming Chang, Huang-Sheng Kung and Yung-Tien Liu	465
An Explicit Bound for Stability of Sinc Bases  Antonio Avantaggiati, Paola Loreti and Pierluigi Vellucci	473
Modeling the G-Protein Signaling of the Retina with Fractional Calculus  Antal Martinecz and Mihoko Niitsuma	481
Optimal $\mathcal{H}_2$ Filtering for Linear Stochastic Systems with Multiplicative White Noise Perturbations and Sampled Measurements Vasile Dragan, Samir Aberkane and Ioan-Lucian Popa	489
HVDC Line Parameters Estimation based on Line Transfer Functions Frequency Analysis Jocelyn Sabatier, Toni Youssef and Mathieu Pellet	497
Design, Analysis and Control of a Semi-active Magnetic Bearing System for Rotating Machine Applications TJ. Yeh	503
Robust Affine Projection Algorithm using Selectively Shrunk Error Component Seung Hun Kim, Jae Jin Jeong, Gyogwon Koo and Sang Woo Kim	511
Tracking Control Synthesis of Nonlinear Polynomial Systems  Bassem Iben Warrad, Mohamed Karim Bouafoura and Naceur Benhadj Braiek	517
Statistical Linearization and Consistent Measures of Dependence: A Unified Approach Kirill Chernyshov	524
A 2 Dimensional Dynamical Model of Asphalt-roller Interaction during Vibratory Compaction Syed Asif Imran, Sesh Communi and Musharraf Zaman	533
Calibration of Laser Range Finders for Mobile Robot Localization in ITER Tiago Sousa, Alberto Vale and Rodrigo Ventura	541
Study of Energy Evaluation Control Yasushi Yamamoto, Shinya Hasegawa, Satoru Iwamori and Shigeru Yamaguchi	550
Analysis of Relay Effect on Wireless Power Transfer Mahdi Zarif, Hamed Aliabadi and Sadegh Khaleghi	554
Diagonal Stability of Uncertain Interval Systems Vakif Dzhafarov (Cafer), Taner Büyükköroğlu and Bengi Yildiz	558
Multiple Model SPGPC for Blood Pressure Control Humberto A. Silva, André Maitelli, Celina Leão and Eurico Seabra	563
Making the Investigation of Huge Data Archives Possible in an Industrial Context - An Intuitive Way of Finding Non-typical Patterns in a Time Series Haystack Yavor Todorov, Sebastian Feller and Roger Chevalier	569

Stimulus  Predictor-based Control of Human Emotions When Reacting to a Dynamic Virtual 3D Face	582
Vytautas Kaminskas, Edgaras Ščiglinskas and Aušra Vidugiriene	
Nonlinear System Identification based on Modified ANFIS José Kleiton Ewerton da Costa Martins and Fábio Meneghetti Ugulino de Araújo	588
Nonlinear Control Design of VSC-MTDC Systems based on Backstepping Approach Mohamed Ayari, Mohamed Moez Belhaouane, Xavier Guillaud and Naceur Benhadj Braiek	596
Estimation of Uniform Static Regression Model with Abruptly Varying Parameters Ladislav Jirsa and Lenka Pavelková	603
Intelligent Fall Prevention for Parkinson's Disease Patients based on Detecting Posture Instability and Freezing of Gait  Jiann-I Pan and Yi-Chi Huang	608
Adaptive Unscented Kalman Filter at the Presence of Non-additive Measurement Noise Manasi Das, Aritro Dey, Smita Sadhu and T. K. Ghoshal	614
Multicriteria Neural Network Design in the Speech-based Emotion Recognition Problem Christina Brester, Eugene Semenkin, Maxim Sidorov and Olga Semenkina	621
A Study on Several Machine Learning Methods for Estimating Cabin Occupant Equivalent Temperature  Diana Hintea, James Brusey and Elena Gaura	629
Dictionary Learning: From Data to Sparsity Via Clustering Rajesh Bhatt and Venkatesh K. Subramanian	635
INTERNATIONAL SPECIAL SESSION ON ARTIFICIAL NEURAL NETWORKS AND INTELLIGENT INFORMATION PROCESSING	
SHORT PAPERS	
Exploring Machine Learning Techniques for Identification of Cues for Robot Navigation with a LIDAR Scanner Aj Bieszczad	645
Grey Relational Analysis based Artificial Neural Networks for Product Design: A Comparative Study  Yang-Cheng Lin and Chung-Hsing Yeh	653
An Experimentation Line for Underlying Graphemic Properties - Acquiring Knowledge from Text Data with Self Organizing Maps  Gilles Bernard, Nourredine Aliane and Otman Manad	659
Evaluation of Processor Health within Hierarchical Condition Monitoring System Lenka Pavelková and Ladislav Jirsa	667
AUTHOR INDEX	673

# 2015 12th International Conference on Informatics in Control, Automation and Robotics (ICINCO 2015)

Colmar, Alsace, France 21-23 July 2015

Volume 2 Pages 1-527



IEEE Catalog Number: CFP15NCO-POD ISBN: 978-1-4673-6944-2

19011.

## **CONTENTS**

#### **INVITED SPEAKERS**

KEYNOTE SPEAKERS	
Formation Control and Vision based Localization of System of Mobile Robots Krzysztof Kozlowski	IS-5
Controlled Magnetic Bearings for Smart Machines Gerhard Schweitzer	IS-7
Mobile Manipulation - Why Are Humans so Much Better? And How Can We Change That? ${\it Oliver Brock}$	IS-9
Rough Terrain Mobile Robotics - From Design to Motion Control and Planning $Fa\ddot{\imath}z\;Ben\;Amar$	IS-11
ROBOTICS AND AUTOMATION	
FULL PAPERS	
3D Positioning Algorithm for Low Cost Mobile Robots Rafael Socas, Sebastian Dormido, Raquel Dormido and Ernesto Fabregas	5
Safe Predictive Mobile Robot Navigation in Aware Environments Michael Arndt and Karsten Berns	15
Kinematic Analysis and Simulation of a Hybrid Biped Climbing Robot Adrian Peidro, Arturo Gil, Jose Maria Marin, Yerai Berenguer and Oscar Reinoso	24
Assistive Robot for Standing with Physical Activity Estimation based on Muscle Arrangements of Human Legs  Daisuke Chugo, Takahiro Yamada, Satoshi Muramatsu, Sho Yokota and Hiroshi Hashimoto	35
Visual Servoing-based Registration of Multimodal Images M. Ourak, B. Tamadazte, N. Andreff and E. Marchand	44
Guaranteed Control of a Robotic Excavator During Digging Process  Alexander Gurko, Oleg Sergiyenko, Juan Ivan Nieto Hipólito, Igor Kirichenko, Vera Tyrsa and  Juan de Dios Sanchez Lopez	52
Analysis of Shapes to Measure Surfaces - An Approach for Detection of Deformations C. M. Mateo, P. Gil, D. Mira and F. Torres	60
RCON: Dynamic Mobile Interfaces for Command and Control of ROS-enabled Robots Robert Codd-Downey and Michael Jenkin	66
A Taxonomy of Distribution for Cooperative Mobile Manipulators  Andreas Schierl, Andreas Angerer, Alwin Hoffmann, Michael Vistein and Wolfgang Reif	74
A Robust Temperature Controller Design for an Innovative Hyperthermic Intraperitoneal Chemotherapy Equipment  Iulia Clitan, Corneliu Lungoci, Vlad Muresan, Daniel Moga and Valentin Sita	
Using Tablets in the Vision-based Control of a Ball and Beam Test-bed Jared A. Frank, José Antonio De Gracia Gómez and Vikram Kapila	92

A Depth-based Approach for 3D Dynamic Gesture Recognition  Hajar Hiyadi, Fakhreddine Ababsa, Christophe Montagne, El Houssine Bouyakhf and Fakhita Regragui	103
Robots Avoid Potential Failures through Experience-based Probabilistic Planning Melis Kapotoglu, Cagatay Koc and Sanem Sariel	111
Continuous Pre-Calculation of Human Tracking with Time-delayed Ground-truth - A Hybrid Approach to Minimizing Tracking Latency by Combination of Different 3D Cameras <i>Philip Nicolai, Jörg Raczkowsky and Heinz Wörn</i>	121
Fast and Robust Keypoint Detection in Unstructured 3-D Point Clouds Jens Garstka and Gabriele Peters	131
Toward a Human-like Locomotion: Modelling Dynamically Stable Locomotion of an Anthropomorphic Robot in Simulink Environment Ramil Khusainov, Ilya Shimchik, Ilya Afanasyev and Evgeni Magid	141
SHORT PAPERS	
A Model Predictive Sliding Mode Control with Integral Action for Slip Suppression of Electric Vehicles  *Tohru Kawabe**	151
Data Fusion Between a 2D Laser Profile Sensor and a Camera $M$ . Wagner, $P$ . $He\beta$ , $S$ . $Reitelshöfer$ and $J$ . $Franke$	159
A Complete Sensor-based System to Navigate Through a Cluttered Environment A. Durand-Petiteville, V. Cadenat and N. Ouadah	166
Flatness based Feed-forward Control of a Flexible Robot Arm under Gravity and Joint Friction <i>Elisha Didam Markus</i>	174
Filling Accuracy Analysis of the Rocket Propellant based on the Flowmeter Measuring Model Xiang Youhuan, Zhang Ping, Liu Weidong and Cui Benting	181
Comparison of Controllable Transmission Ratio Type Variable Stiffness Actuator with Antagonistic and Pre-tension Type Actuators for the Joints Exoskeleton Robots Hasbi Kizilhan, Ozgur Baser, Ergin Kilic and Necati Ulusoy	188
Feasibility Study of a Pair of 2-DOF Step-climbing Units for a Manual Wheelchair User Yoshikazu Mori, Kaoru Katsumura and Katsuya Nagase	196
Relative Height Estimation using Omnidirectional Images and a Global Appearance Approach Yerai Berenguer, Luis Payá, Adrian Peidro and Oscar Reinoso	202
Rotation-Invariant Image Description from Independent Component Analysis for Classification Purposes  Rodrigo D. C. da Silva, George A. P. Thé and Fátima N. S. de Medeiros	210
New Approach to the Artificial Force Concept for Skid-steering Mobile Platform Alicja Mazur, Wojciech Domski, Mirela Kaczmarek and Mateusz Cholewinski	217
Detection and Implementation Autonomous Target Tracking with a Quadrotor AR. Drone $K.\ Boudjit\ and\ C.\ Larbes$	223
Next Generation Networks for Telecommunications Operators Providing Services to Transnational Smart Grid Operators  Gurkan Tuna, George C. Kiokes, Erietta I. Zountouridou and V. Cagri Gungor	231

An Adaptive Sliding Mode Controller for Synchronized Joint Position Tracking Control of Robot Manipulators  Youmin Hu, Jie Liu, Bo Wu, Kaibo Zhou and Mingfeng Ge	239
Feature and Decision Level Audio-visual Data Fusion in Emotion Recognition Problem Maxim Sidorov, Evgenii Sopov, Ilia Ivanov and Wolfgang Minker	246
Design of Mobile Microrobots with Thermomechanical Actuators N. N. Bolotnik, V. G. Chashchukhin, V. G. Gradetsky, D. V. Kozlov, I. P. Smirnov, A. N. Sukhanov and A. A. Zhukov	252
A Physics-based Optimization Approach for Path Planning on Rough Terrains Diogo Amorim and Rodrigo Ventura	259
HybridSLAM: A Robust Algorithm for Simultaneous Localization and Mapping Amir Hossein Monjazeb, Jurek Sasiadek and Dan Necsulescu	267
A Formation Control Algorithm by Modified Next-state Approximation to Reduce Communication Requirements in Multirobot Systems  *Roshin Jacob Johnson and Asokan Thondiyath*	275
Control Algorithm for a Cooperative Robotic System in Fault Conditions <i>Viorel Stoian and Eugen Bobasu</i>	281
Socio-cyberphysical System for Proactive Driver Support - Approach and Case Study Alexander Smirnov, Nikolay Shilov and Oleg Gusikhin	289
Fast Moving Object Detection from Overlapping Cameras Mikaël A. Mousse, Cina Motamed and Eugène C. Ezin	296
Human-like Humanoid Robot Posture Control M. Zebenay, V. Lippi and T. Mergener	304
A Relative Measurement based Leader-follower Formation Control of Mobile Robots Yu. N. Zolotukhin, K. Yu. Kotov, A. S. Maltsev, A. A. Nesterov, M. A. Sobolev and M. N. Filippov	310
A Vision-based Line Following Strategy for an Autonomous UAV Alexandre Brandão, Felipe Martins and Higor Soneguetti	314
Y-Pod Formation of Swarm Robots using Amber Force Fields Purushotham Muniganti and Albert Oller Pujol	320
Exploring the Role of a Smartphone as a Motion Sensing and Control Device in the Wireless Networked Control of a Motor Test-bed Jared A. Frank, Anthony Brill, Jonghyun Bae and Vikram Kapila	328
Bio-inspired Morphing Caudal Fin using Shape Memory Alloy Composites for a Fish-like Robot - Design, Fabrication and Analysis  William Coral, Claudio Rossi and Irene Perrino Martin	336
Comparison of Robust Control Techniques for Use in Flight Simulator Motion Bases ${\it Mauricio  Becerra-Vargas}$	344
Three-Layered Software Architecture and Its Variability for Teleoperated System Yasuharu Kunii, Yoshiki Matsui and Masaru Furukawa	349
Comparative Analysis of Methods for the Log Boundaries Isolation Artem Kruglov and Yuriy V. Chiryshev	357

Progressive Co-adaptation in Human-Machine Interaction Paolo Gallina, Nicola Bellotto and Massimiliano Di Luca	362
A Tactile-based Grasping Strategy for Deformable Objects' Manipulation and Deformability Estimation  A. Delgado, C. A. Jara, D. Mira and F. Torres	369
A Trajectory Tracking Control of a Skid Steered Mobile Cleaning Robot Seungwoo Jeon Jeon, Wootae Jeong, Soon-Bark Kwon, Cheulkyu Lee and Duckshin Park	375
Adaptive 3-D Object Classification with Reinforcement Learning  Jens Garstka and Gabriele Peters	381
Impedance Control based Force-tracking Algorithm for Interaction Robotics Tasks: An Analytically Force Overshoots-free Approach  Loris Roveda, Federico Vicentini, Nicola Pedrocchi and Lorenzo Molinari Tosatti	386
Human Motion Tracking Control for Humanoid Robot based on the Optimized Motion Retargeting Wenjie Wang, Weiwei Yu, Xiansheng Qin, Hongbo Wang, Jie Hong and Yangyang Feng	392
Issues and Challenges in Robotic Trimming of CFRP Mohamed Slamani and Jean Francois Chatelain	400
Motion Curved Surface Analysis and Composite for Skill Succession using RGBD Camera Kaoru Mitsuhashi, Hiroshi Hashimoto and Yasuhiro Ohyama	406
Dynamic Obstacle Avoidance using Online Trajectory Time-scaling and Local Replanning Ran Zhao and Daniel Sidobre	414
Visual based Navigation of a Free Floating Robot by Means of a Lab Star Tracker Marco Sabatini, Giovanni B. Palmerini and Paolo Gasbarri	422
Salient Foreground Object Detection based on Sparse Reconstruction for Artificial Awareness Jingyu Wang, Ke Zhang, Kurosh Madani, Christophe Sabourin and Jing Zhang	430
Towards Multi-functional Robot-based Automation Systems  Andreas Angerer, Michael Vistein, Alwin Hoffmann, Wolfgang Reif, Florian Krebs and Manfred Schönheits	438
Range Data Fusion for Accurate Surface Generation from Heterogeneous Range Scanners Mahesh Kr. Singh, K. S. Venkatesh and Ashish Dutta	444
Reactive Planning on a Collaborative Robot for Industrial Applications Gautier Dumonteil, Guido Manfredi, Michel Devy, Ambroise Confetti and Daniel Sidobre	450
INDUSTRIAL INFORMATICS	
SHORT PAPERS	
Geographic Information Science and Technology as Key Approach to unveil the Potential of Industry $4.0$ - How Location and Time Can Support Smart Manufacturing Stefan Schabus and Johannes Scholz	463
Towards the Quality Evaluation of Software of Control Systems of Nuclear Power Plants: Theoretical Grounds, Main Trends and Problems <i>Elena Jharko</i>	
Analysis of Thermographic Patterns using Open CV - Case Study: A Clinker Kiln Villie Morocho, Eliezer Colina, Sebastian Bautista, Alfredo Mora and Mara Falconi	479

Order-up-to Networked Policy for Periodic-Review Goods Distribution Systems with Delay  Przemyslaw Ignaciuk  FPGA-SOPC based Motion Controller with ACC/DEC using Digital Convolution  Haiming Huang, Guangsheng Li and Wusheng Chou  Design of i-Fields System Component: Computer Model of Oil-Recovery by Polymer Flooding  D. Zh. Ahmed-Zaki, S. T. Mukhambetzhanov and T. S. Imankulov  Library for Simplified Timer Implementation using Standard C++	Manufacturing System  485  Mary Tshibangu
Przemyslaw Ignaciuk  FPGA-SOPC based Motion Controller with ACC/DEC using Digital Convolution  Haiming Huang, Guangsheng Li and Wusheng Chou  Design of i-Fields System Component: Computer Model of Oil-Recovery by Polymer Flooding  D. Zh. Ahmed-Zaki, S. T. Mukhambetzhanov and T. S. Imankulov  Library for Simplified Timer Implementation using Standard C++  517	493
Haiming Huang, Guangsheng Li and Wusheng Chou  Design of i-Fields System Component: Computer Model of Oil-Recovery by Polymer Flooding D. Zh. Ahmed-Zaki, S. T. Mukhambetzhanov and T. S. Imankulov  Library for Simplified Timer Implementation using Standard C++	498
D. Zh. Ahmed-Zaki, S. T. Mukhambetzhanov and T. S. Imankulov  Library for Simplified Timer Implementation using Standard C++  517	504
517	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Sergio F. Lopes, Paulo vicenie ana Ricarao Gomes	r Simplified Timer Implementation using Standard C++ opes, Paulo Vicente and Ricardo Gomes  517
AUTHOR INDEX 525	INDEX 525