

Proceedings of the 14th International Carpathian Control Conference

(ICCC 2013)

**Rytro, Poland
26 – 29 May 2013**



**IEEE Catalog Number: CFP1342L-POD
ISBN: 978-1-4673-4488-3**

Plenary Keynote

The Global Theory of Nonlinear Systems #5
Stephen Banks

Technical Papers

Process Capability Index as an Indicator of Input Signal Quality of the Rock Disintegration Process
Vladena Baranova, Lenka Landryová and Jozef Futó

Variable Structure Flow Controller for Connection-Oriented Communication Networks
Andrzej Bartoszewicz and Piotr Leśniewski

Source Code Recognition by Graph Algorithm
Tomáš Bublík and Miroslav Vírúš

PID Tuning Using B-Parabolas: A Tool to Translate Time Domain Performance Specification Into Frequency Domain Performance Measures
Štefan Bucz, Alena Kozáková and Vojtech Veselý

A New Robust PID Controller Design Technique Using Bode-Interpolation
Štefan Bucz, Alena Kozáková and Vojtech Veselý

Quadratic Embedding into Algebras and Global Stabilization for a Class of Nonlinear Control Systems
Francesco Carravetta

Software Support for Quality Control in Coal and Coke Production in OKD, a.s.
Roman Danel, Lukas Otte, Vladislav Vancura, Zdenek Neustupa and Zdenek Seliga

The Logistics Information System in Production Company
Dušan Dorčák

Application Of PID Retuning Method for Laboratory Feedback Control System Incorporating Fractional-Order Dynamics
Lubomír Dorčák, Emmanuel Gonzalez, Ján Terpák, Ivo Petráš, Juraj Valsa and Monika Žecová

Robust Control Algorithms and The State Variable Aggregation Method
Tomáš Duda and Antonín Víteček

Thermal Analysis of Solenoid Actuators
Ivor Důlk and Tamás Kovács házy

Indirect Temperatures Measurement in the UCG Process
Milan Durdán and Ján Kačur

Program Control of the Annealing Process with Utilization of the Indirect Measurement
Milan Durdán, Ján Kačur and Marek Laciak

The Impact of the Sampling Frequency at Indirect Measurement
Milan Durdán, Marcela Malindžáková, Jozef Futó and Ján Kačur

The Proposal of the Monitoring System of the Annealing Process in the SCADA system Promotic
Milan Durdán, Ján Kačur and Marek Laciak

Operational Recommendations for Pyrolysis Unit Cooler Based on Mathematical Model ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Radim Farana and Radek Svoboda

On the Takagi-Sugeno Model-Based State Estimation for One Class of Bilinear Systems ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Anna Filasová and Dušan Krokavec

On the Mathematical Properties of Generalized Fractional-Order Two-Port Networks Using Hybrid Parameters ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Emmanuel Gonzalez, Ľubomír Dorčák, Ivo Petráš and Ján Terpák

Virtual Collocation of Sensors and Actuators for a Flexible Rotor Supported by Active Magnetic Bearings ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Zdzisław Gosiewski and Zbigniew Kulesza

LQG Control of Piezoelectric Smart Truss ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Dariusz Grzybek

Two-Stage Estimation of Spacecraft Position and Velocity Via Single Station Antenna Tracking Data ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Chingiz Hajiyev and Ahmet Sofyali

Reliability Analysis in Systems Man-Machine Systems ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Marie Havlikova and Miroslav Jirgl

Simulation Study of a Vibration Isolation System with Nonlinear Damping Implemented by an MR Damper ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Carmen Ho, Zi-Qiang Lang, Stephen Billings and Bogdan Sapiński

Generation a Form's Input Elements Select and Radio Type Using Web Service ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Pavel Horovčák, Ján Terpák and Beata Stehlíková

Fractional Order Hybrid Systems and Their Stability ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
S. Hassan Hosseinnia, Ines Tejado and Blas M Vinagre

Parallel Pattern Mining on Graphics Processing Units ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Krzysztof Hryniów

Experimental and Numerical Studies of Magnetorheological Damper Control Coil Type RD-8040-3 ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Łukasz Jastrzębski and Marcin Węgrzynowski

Utilization of the PLC as a Web Server for Remote Monitoring of the Technological Process ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Ján Kačur, Milan Durdán and Marek Laciak

Mathematical Model for the Rotary Furnace Predictive Control ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Imrich Košťial, Dušan Naščák, Ján Kerekanič and Peter Košinár

Simulation Mathematical Model for Granular Material Thermal Treatment ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Imrich Košťial, Ján Spišák, Ján Mikula, Katarína Mikulová Polčová and Martin Truchly

Simulation Analysis of Shape Gasifying Front ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Karol Kostúr

The Development Of Control System for Preheating Furnace by Simulation Model ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Karol Kostúr

Bi-Axial Inverted Pendulum Modelling ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
Andrzej Kot

Test Environment for the Evaluation of IEEE 1588 Solutions Including High Precision PPS Output Performance Measurements

Tamas Kováčsházy and Balint Ferencz

Fault Detection in Linear Systems with Distributed Time Delays

Dušan Krokavec and Anna Filasová

RFID and Augmented Reality

Lukáš Kubáč, Filip Beneš, Vladimír Kebo and Pavel Staša

Multisine Excitation Technique for Rotor Crack Detection

Zbigniew Kulesza

Application of Acoustic Model for Optimum Determination in Rock Drilling Process Based on Acoustic Pressure in Octave Bands

Milan Labas, Lucia Ivanicova, Frantisek Krepelka, Jozef Futó and Vladena Baranova

Designing of the Technological Line in the SCADA System Promotic

Marek Laciak and Marian Šofranko

The Modeling of Multibody Systems with Fractional-Order Elements

Janusz Kowal and Wojciech Lepiarz

Some Problems in Application of the Theory of Abstract Spaces

Igor Leššo, Patrik Flegner, Katarína Feriančíková and Zuzana Sabová

Maximum Likelihood Estimation: A Method for Flight Dynamics - Angle of Attack Estimation

Piotr Lichota and Maciej Lasek

Modeling of Electrical Drive System with Flexible Shaft Based on Fractional Calculus

Michal Macias and Dominik Sierociuk

Verification Method of Rotors Instability Measurement

Miroslav Mahdal, Jaroslav Los and Jaromír Zavadil

State Blocking Systems: Modeling and Behavior

Constantin Marin, Dan Selisteanu and Dorin Sendrescu

Wind Turbine's Tower-Nacelle Model with Magnetorheological Tuned Vibration Absorber

Paweł Martynowicz and Zbigniew Szydło

Conceptual Model for Mechatronic Design in the Basis of Hierarchical Systems Technology

Kanstantsin Miatliuk

Heat Transfer Mathematical Modelling in the Cooling Systems of Impure Process Gases in Copper Metallurgy

Adam Milejski and Henryk Rusinowski

Brain - Computer Interface based on Steady - State Visual Evoked Potentials (SSVEP)

Agata Nawrocka and Karolina Holewa

Control of the Hydraulic Drive Using Embedded Control System

Petr Noskievič

Capability Analysis for Leagile Manufacturing Processes

Darja Noskievičová

Fuzzy Sliding Mode Control for Trajectory Tracking and Force Compensation of a Robotic Haptic Interface

Santos M. Orozco-Soto, Julio C. Ramos-Fernández, Abel García-Barrientos, C. A. Vilchis-Rodríguez and O. A. Domínguez-Ramírez

Inventory Replenishment Control: A Predictive Approach

Joanna Ewa Orzechowska, Andrzej Bartoszewicz, Keith Burnham and Dobrila Petrovic

Identification of In-Line Electric Actuator

Michal Ostaszewski and Franciszek Siemieniako

Inverse LuGre Mmodel for a Small-Scale MR Damper

Piotr Palka and Marcin Maślanka

Data-logger Built Using a Digital Multimeter and Virtual Instrumentation

Nicolae Patrascoiu and Camelia Ioana Barbu

Remarks on Observability of H-Difference Linear Control Systems With Two Fractional Orders

Ewa Pawluszewicz and Dorota Mozyrska

An Adaptive Fractional-Order Controller

Ivo Petráš

Rapid Prototyping in Development of Numerically Controlled Machine Tool Feed Drive Module Control System

Krzysztof Pietrusewicz and Pawel Waszczuk

Dynamic Modeling of PAM Based Actuator Using Modified Hill's Muscle Model

Ján Pitel' and Mária Tóthová

Free Vibration Control of an Cantilever MR Fluid Based Sandwich Beam

Mateusz Romaszko

Mathematical Modelling of Selected Processes Utilizing Combustible Process Gases

Henryk Rusinowski, Zbigniew Buliński and Adam Milejski

Reduction of Cogging Force in an Electromechanical Transducer Powering an MR Linear Damper

Bogdan Sapiński and Marcin Węgrzynowski

Comparison of GUM and Monte Carlo Method for Evaluation Measurement Uncertainty of Indirect Measurements

Sona Sediva and Marie Havlikova

Control of Discrete-Time Linear Systems Constrained in Output by Equality Constraints

Pavol Liščinský and Vladimír Serbák

Comparison of Variable Fractional Order PID Controller for Different Types of Variable Order Derivatives

Dominik Sierociuk and Michał Macias

On a New Definition of Fractional Variable-Order Derivative

Dominik Sierociuk, Wiktor Malesza and Michał Macias

The Estimation of Resolution in 3D Range Image System

Andrzej Sioma

Rating Web Sites Combining of Heuristic Methods with Numerical Linear Algebra

Petr Staníček, Lukas Richtr and Radim Farana

Using HTML5 Web Interface for Visualization and Control System

Martin Stříbný and Pavel Smutný

Analysis Of Model Reference Control Based on Modified Laguerre Network with Integrator

Jozef Škultéty, Eva Miklovičová and Ruth Bars

Safety Through Common Industrial Protocol (&
Radek Štohl and Karel Stibor

Modal Analysis of the Cantilever Beam * +
Pavel Šuránek, Miroslav Mahdal, Jiří Tůma and Jaromír Zavadil

Comparising of Antialiasing Filters in A/D Converters +'
Pavel Šuránek, Jiří Tůma and Miroslav Mahdal

Efficient Analog Implementation of Fractional-Order Controllers ++
Aleksei Tepjakov, Eduard Petlenkov and Juri Belikov

Graphic Presentation of Selected Thermochemical Properties of Substances in Matlab Using Service Oriented Architecture ,'
Ján Terpák, Pavel Horovčák, Ľubomír Dorčák and Monika Žecová

Algorithms for the Vold-Kalman Multiorder Tracking Filter , ,
Jiří Tůma

Control Algorithms of Infiltration Water Intake Under Uncertainty -)
Andrzej Urbaniak

Application of Fuzzy Transform for Noise Reduction in Helicopter Model Identification (\$\$
Radek Valášek, Viktor Pavliška, Irina Perfilieva and Radim Farana

Water Pollution Petrochemical Products Monitoring System Using Optical Fibre Refractometer (\$*
József Vásárhelyi, Ján Turán, Ľuboš Ovseník and János Végh

The von Neumann Computer Model on the Mirror of New Technologies (%%
János Végh, József Vásárhelyi, Ján Turán and Dániel Drótos

Gain-scheduled Controller Design: MIMO Systems (%+
Vojtech Veselý and Adrian Ilka

Ultimate Parameters in Control Technology (&
Miluše Vítečková and Antonín Víteček

Simple Digital Controller Tuning (&,
Miluše Vítečková and Antonín Víteček

Two Dimensional Fourier Transform using MATLAB (' &
Jaromir Zavadil, Jiří Tůma, Jan Valicek, Miroslav Mahdal and Jaroslav Los

Usage of the Heat Conduction Model for the Experimental Determination of Thermal Diffusivity (' *
Monika Žecová, Ján Terpák and Ľubomír Dorčák