Final Technical Programme

12th European Workshop on Advanced Control and Diagnosis (ACD2015)

ACD

advanced control & diagnosis 20 15

OPENING CEREMONY (Nov. 19, 8:45 - 9:00, room US207)

Ondřej Straka

PLENARY LECTURE ThMP (Nov. 19, 9:00 - 10:00, room US207)

Fredrik Gustafsson. Automotive Sensor Mining for Tire Pressure Monitoring

Chair: Józef Korbicz

TECHNICAL SESSION: ThM1 (Nov. 19, 10:20 - 12:20, room US217)
CONTROL THEORY

Chair: Ladislav Král

ThM1-1 (10:20 - 10:40)**:** Dušan Krokavec and Anna Filasová. Control Design for Discrete-time State-multiplicative Noise Stochastic Systems

ThM1-2 (10:40 - 11:00)**:** Lukasz Gadek, Leszek Koszalka and Keith Burnham. Computation of Equivalent Poles Placement for Class of 2nd Order Discrete Bilinear Systems

ThM1-3 (11:00 - 11:20)**:** Marcin Boski and Wojciech Paszke. Application of a Repetitive Process Setting to Design of Monotonically Convergent Iterative Learning Control

ThM1-4 (11:20 - 11:40)**:** Jorge Dávila, Jérôme Cieslak, David Henry and Ali Zolghadri. Fault Tolerant Controller for a Class of Additive Faults: A Quasi-continuous High-order Sliding Mode Approach

ThM1-5 (11:40 - 12:00)**:** Jakub Prüher and Ladislav Král. Functional Dual Adaptive Control with Recursive Gaussian Process Model

ThM1-6 (12:00 - 12:20)**:** Anna Filasová, Dušan Krokavec and Vladimír Serbák. Design of FTC Structures with PI Virtual Actuators

TECHNICAL SESSION: ThM2 (Nov. 19, 10:20 - 12:20, room US207)
IDENTIFICATION AND SIGNAL PROCESSING

Chair: Henrik Niemann

ThM2-1 (10:20 - 10:40)**:** Marcel Luzar and Andrzej Czajkowski. SSNN Toolbox for Non-linear System Identification

ThM2-2 (10:40 - 11:00)**:** André Sekunda, Henrik Niemann, Niels Kjølstad Poulsen and Ilmar Santos. Closed Loop Identification using a Modified Hansen Scheme

ThM2-3 (11:00 - 11:20)**:** Vít Škvára, Václav Šmídl and Jakub Urban. On-line Model Structure Selection for Estimation of Plasma Boundary in a Tokamak

ThM2-4 (11:20 - 11:40)**:** Sergey Kolyubin, Leonid Paramonov and Anton Shiriaev. Robot Kinematics Identification: KUKA LWR4+ Redundant Manipulator Example

ThM2-5 (11:40 - 12:00)**:** Karel Kalista and Jindřich Liška. Time--frequency Methods for Signal Analysis in Wind Turbines

ThM2-6 (12:00 - 12:20)**:** Claudius Ortbandt, Cezary Dzienis, Robert Matussek and Horst Schulte. Parameter Estimation in Electrical Power Systems using Prony's Method

PLENARY LECTURE ThAP (Nov. 19, 13:40 - 14:40, room US217)

Vladimír Havlena. Advanced Process Control for Energy Efficiency

Chair: Jindřich Duník

TECHNICAL SESSION: ThA1 (Nov. 19, 15:00 - 17:00, room US217)
CONTROL APPLICATIONS I

Chair: Dušan Krokavec

ThA1-1 (15:00 - 15:20)**:** Silvia Maria Zanoli, Crescenzo Pepe and Luca Barboni. Application of Advanced Process Control Techniques to a Pusher Type Reheating Furnace

ThA1-2 (15:20 - 15:40)**:** Adel Belkadi, Laurent Ciarletta and Didier Theilliol. Particle Swarm Optimization Method for the Control of a Fleet of Unmanned Aerial Vehicles

ThA1-3 (15:40 - 16:00)**:** Martin Goubej, Alois Krejčí and Jan Reitinger. New Virtual Laboratories Presenting Advanced Motion Control Concepts

ThA1-4 (16:00 - 16:20)**:** Lukas R. S. Theisen, Hans H. Niemann, Roberto Galeazzi and Ilmar F. Santos. Gas Bearing Control for Safe Operation in Critical Speed Regions - Experimental Verification

ThA1-5 (16:20 - 16:40)**:** Ralf Stetter and Manikandan Swamy Prasad. Realization of a Complex Control & Diagnosis System on Simplified Hardware

ThA1-6 (16:40 - 17:00)**:** Gerasimos Rigatos. Flatness-based Embedded Control in Successive Loops for Spark-ignited Engines

TECHNICAL SESSION: ThA2 (Nov. 19, 15:00 - 17:00, room US207)
ESTIMATION AND FILTERING

Chair: Václav Šmídl

ThA2-1 (15:00 - 15:20)**:** Daniel Dolz, Ignacio Peñarrocha and Roberto Sanchis. A Gain-scheduled Observer under Transmissions without Delivery Acknowledgment

ThA2-2 (15:20 - 15:40)**:** Manuel Schimmack, Susan Nguyen and Paolo Mercorelli. Implemented Wavelet Packet Tree based Denoising Algorithm in Bus Signals of a Wearable Sensorarray

ThA2-3 (15:40 - 16:00)**:** Jindřich Havlík and Ondřej Straka. Performance Evaluation of Iterated Extended Kalman Filter with Variable Step-length

ThA2-4 (16:00 - 16:20)**:** Nicolas Ellero, David Gucik-Derigny and David Henry. Interval Observer for Linear Time Invariant (LTI) Uncertain Systems with State and Unknown Input Estimations

ThA2-5 (16:20 - 16:40)**:** Idellette Judith Hermine Som, Vincent Cocquempot and Abdel Aitouche. Exponential Boundary Observers for Pressurized Water Pipe

ThA2-6 (16:40 - 17:00)**:** Mariusz Buciakowski, Marcin Witczak and Didier Theilliol. Robust State Estimation and Control for Nonlinear System with Uncertain Parameters

PLENARY LECTURE FrMP (Nov. 20, 8:30 - 9:30, room US 217)

Silvio Simani. Advanced Issues on Wind Turbine Modelling and Control

Chair: Ivo Punčochář

TECHNICAL SESSION: FrM1 (Nov. 20, 10:30 - 12:30, room US217)
CONTROL APPLICATIONS II

Chair: Niels Kjølstad Poulsen

FrM1-1 (10:30 - 10:50)**:** Valentin Preda, Jérôme Cieslak, David Henry, Samir Bennani and Alexandre Falcoz. Microvibration Attenuation based on H-infinity/LPV Theory for High Stability Space Missions
FrM1-2 (10:50 - 11:10)**:** Daniel Straßberger, Paolo Mercorelli and Oleg Sergiyenko. A Geometric Approach to Decouple Robotino Motions and its Functional Controllability
FrM1-3 (11:10 - 11:30)**:** Emil Pricop, Florin Zamfir and Nicolae Paraschiv. Feedback Control System based on a Remote Operated PID Controller Implemented using mbed NXP LPC1768 Development Board
FrM1-4 (11:30 - 11:50)**:** Daniel Straßberger, Paolo Mercorelli and Oleg Sergiyenko. A Decoupled MPC for Motion Control in Robotino using a Geometric Approach
FrM1-5 (11:50 - 12:10)**:** Aleksandra Oswiecinska, Jason Hibbs, Ivan Zajic and Keith J. Burnham. Towards Energy Efficient Operation of Heating, Ventilation and Air Conditioning Systems via Advanced Supervisory Control Design
FrM1-6 (12:10 - 12:30)**:** Sreejith R, Naran M. Pindoriya and Babji Srinivasan. A Novel Control Algorithm based DSTATCOM for Load Compensation

TECHNICAL SESSION: FrM2 (Nov. 20, 10:30 - 12:30, room US207)
FAULT DETECTION

Chair: Didier Maquin

FrM2-1 (10:30 - 10:50)**:** Maya Kallas, Gilles Mourot, Didier Maquin and José Ragot. Detection, Isolation and Fault Estimation of Nonlinear Systems using a Directional Study
FrM2-2 (10:50 - 11:10)**:** Ester Sales-Setién, Ignacio Peñarrocha, Daniel Dolz and Roberto Sanchis. Fault Detection in the Blade and Pitch System of a Wind Turbine with H2 PI Observers
FrM2-3 (11:10 - 11:30)**:** Andrzej Czajkowski. Design of Sensor and Actuator Multi Model Fault Detection and Isolation System using State Space Neural Networks
FrM2-4 (11:30 - 11:50)**:** Yijun Pan, Chunjie Yang, Youxian Sun, Ruqiao An and Lin Wang. Fault Detection with Principal Component Pursuit Method
FrM2-5 (11:50 - 12:10)**:** Dušan Krokavec, Anna Filasová and Pavol Liščinský. On Fault Detection Filters Design with Unitary Transfer Function Matrices
FrM2-6 (12:10 - 12:30)**:** Diana Hernández-Alcantara, Ruben Morales-Menendez and Luis Amezquita-Brooks. Fault Detection for Automotive Shock Absorber

PLENARY LECTURE FrAP (Nov. 20, 14:00 - 15:00, room US217)

Robert Babuška. Learning Control in Robotics

Chair: Ondřej Straka

TECHNICAL SESSION: FrA1 (Nov. 20, 15:20 - 17:20, room US217)
SYSTEM THEORY

Chair: Horst Schulte

FrA1-1 (15:20 - 15:40)**:** Péter Polcz, Gábor Szederkényi and Tamás Péni. An Improved Method for Estimating the Domain of Attraction of Nonlinear Systems Containing Rational Functions

FrA1-2 (15:40 - 16:00)**:** Konrad Andrzej Markowski. Digraph-Based Algorithm for Finding Minimal Positive Realisation of Two-Dimensional Linear System with Delays

FrA1-3 (16:00 - 16:20)**:** Svetlana Rozhkova, Valentina Rozhkova, Vladimir Lasukov and Elena Devyashina. On the Separation Theorem of Stochastic Systems in the Case Of Continuous Observation Channels with Memory

FrA1-4 (16:20 - 16:40)**:** Konrad Andrzej Markowski. Positive Stable Realisation of Fractional Electrical Circuits Consisting of n Subsystem

FrA1-5 (16:40 - 17:00)**:** Svetlana Rozhkova, Valentina Rozhkova, Vladimir Lasukov and Elena Devyashina. On the Separation Theorem of Stochastic Systems in the Case Of Continuous-Discrete Observation Channels with Memory

TECHNICAL SESSION: FrA2 (Nov. 20, 15:20 - 17:20, room US207)
FAULT DETECTION AND CONTROL

Chair: Paolo Mercorelli

FrA2-1 (15:20 - 15:40)**:** Achraf Cohen, Teodor Tiplica and Abdessamad Kobi. Statistical Process Control for AR(1) or Non-Gaussian Processes using Wavelets Coefficients

FrA2-2 (15:40 - 16:00)**:** Antonín Bouberle, Jan Jakl and Jindřich Liška. Rotor Thermal Stress Monitoring in Steam Turbines

FrA2-3 (16:00 - 16:20)**:** Stefan Windmann and Oliver Niggemann. Data-Driven Assistance Functions for Industrial Automation Systems

FrA2-4 (16:20 - 16:40)**:** Jan Škach and Ivo Punčochář. Active Fault Detection: A Comparison of Probabilistic Methods

FrA2-5 (16:40 - 17:00)**:** Lin Wang, Chunjie Yang, Youxian Sun, Yijun Pan and Ruqiao An. Switched Fault Diagnosis Approach for Industrial Processes based on Hidden Markov Model

POSTER SESSION: FrPS (Nov. 20, 9:30 - 10:30, lobby)

PS-1: Piotr Gamorski. Sliding Mode Control of Continuous Time Systems with Reaching Law based on Exponential Function

PS-2: Tobias Sprodowski and Jürgen Pannek. Stability of distributed MPC in an Intersection Scenario

PS-3: Uladzimir Diomin, Piotr Witczak and Ralf Stetter. Event-based and Multi Agent Control of an Innovative Wheelchair

PS-4: Jaromír Strnad and Jindřich Liška. Diagnostic Methods of a Bladed Disc Mode Shape Evaluation used for Shrouded Blades in Steam Turbines

PS-5: Souad Bezzaoucha and David Henry. An LMI Approach for the Integral Sliding Mode and H-infinity State Feedback Control Problem

PS-6: Ondřej Severa, Martin Goubej and Jana Konigsmarkova. Unified Framework for Generation of 3D Web Visualization for Mechatronic Systems

PS-7: Gustavo Pérez, Louise Travé-Massuyès, Elodie Chanthery and Javier Sotomayor. Decentralized Diagnosis in a Spacecraft Attitude Determination and Control System

PS-8: Stefan Windmann, Alexander Maier, Oliver Niggemann, Christian Frey, Ansgar Bernardi, Ying Gu, Holger Pfrommer, Thilo Steckel, Michael Krüger and Robert Kraus. Big Data Analysis of Manufacturing Processes

PS-9: Ralf Stetter and Avery Simundsson. Control and Diagnosis in Integrated Product Development – Observations during the Development of an AGV

PS-10: Oliver Kost, Ondřej Straka and Jindřich Duník. Identification of State and Measurement Noise Covariance Matrices using Nonlinear Estimation Framework