



Technical University of Liberec



Université Paul Sabatier

10<sup>th</sup> IEEE workshop on Electronics,  
Control, Measurement and Signals 2011

## ***ECMS 2011***

Wednesday 1<sup>st</sup> to Friday 3<sup>rd</sup> June 2011  
Liberec, Czech Republic

### **PROGRAMME**

Organized by:  
Technical University of Liberec



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## **FOREWORD TO THE 10<sup>TH</sup> IEEE ECMS WORKSHOP**

The doctoral workshop on Electronics, Control, Measurement and Signals (ECMS) has been organized by Technical University of Liberec (Faculty of Mechatronics, Informatics and Interdisciplinary Studies), and by Paul Sabatier University Toulouse biannually in the Czech Republic (1993, 1995, 1999, 2003, 2007, 2011), France (1997, 2001, 2005) and Spain (2009).

Over the years, ECMS has earned a good reputation as a valuable forum for exchanging ideas, presenting research results as well as practical applications in the fields of mechatronics and advanced control, signal and image processing, intelligent materials and devices, physics in mechatronics, and electronics and data processing. This year, the ECMS doctoral workshop takes place in Liberec, Czech Republic. It will host researchers, PhD students and experts from the both universities and the industry.

The symposium is sponsored by the IEEE Computer Society, the Test Technology Technical Council and by the following partners: ČEZ, Technical University of Liberec, Center for Nanomaterials, Advanced Technologies and Innovations, International Center for Piezoelectric Research, and Paul Sabatier University Toulouse.

This year, 62 papers were submitted from 9 countries in Europe, Asia, and America. Thanks to the precious work of the Programme Committee members and with a great help of more than 124 reviews, a high-quality technical program for the three-day workshop has been prepared. The technical program consists of 5 invited papers, 2 selected keynote speeches on the recent problems and innovations in mechatronics and advanced control, signal and image processing, intelligent materials and devices, and 33 oral presentations. Considering the results of the reviewer reports, technical quality of the manuscripts, and their overall presentation, the Programme Committee has selected 14 extra papers for a publication in the IEEE ECMS 2011 proceedings (23%) and 19 papers have been accepted for the informal ECMS 2011 proceedings (31%). Unfortunately, 18 contributions have been rejected or withdrawn (35%).

The ECMS Steering Committee would like to thank our foreign members, namely Michel Courdesses, Josiane Poque, Yannick Deville, Pascal Sainrat, and Juan Carlos Mugarza, for their efforts in organizing this meeting. Appreciation and many thanks go to all volunteers, the members of the Programme

Committee and the Organization Committee, for their excellent work. This meeting would not be possible without the support of many organizations such as the Technical University of Liberec, the IEEE Computer Society, and the Test Technology Technical Council, and our sponsors. Last but not least, the Committee is grateful to the Mayor of the town of Liberec, Mrs. Martina Rosenbergová, for her auspices of the event.

We wish all symposium participants to enjoy interesting presentations, to have an opportunity for refreshing their contacts and for making new ones, and to find ideas for future cooperation. Furthermore, we wish all visitors a pleasant and inspiring atmosphere during the IEEE ECMS 2011 doctoral workshop in Liberec.

Welcome to the IEEE ECMS doctoral workshop in Liberec!

Jaroslav Nosek, Philippe Joly, Zdeněk Plíva, Jan Nouza, Martin Rozkovec, Pavel Mokrý, and Aleš Richter.

## **SOCIAL EVENTS**

### **Welcome Party**

A Welcome Party will be held at the Student Canteen of the TUL campus on June 1<sup>st</sup>, 2011 at 19.00.

### **Banquet**

A Conference Diner will be held at the Hotel Zlatý lev, Guttenbergova Str. in the Liberec downtown on June 2<sup>nd</sup>, 2011 at 19.00. The Conference Dinner will be opened with the performance of the Choir of the Faculty of Mechatronics, Informatics and Interdisciplinary Studies, Technical University of Liberec.

## **POST-CONFERENCE EVENTS**

On June 3<sup>rd</sup>, 2011 afternoon, following events will be available for the participants of IEEE ECMS-2011:

### **Guided Tour of the Botanic Garden**

A guided tour through the Botanic Garden in Liberec followed by a dinner will be organized from 13:30 till 19:30. Participants cover the Botanic Garden entrance fee and the dinner. Price 12 EUR.

### **Trip to Krkonoše Mountains and the visit of Mumlava Falls**

A guided Trip to Krkonoše Mountains and the visit of Mumlava Falls followed by a dinner will be organized from 13:30 till 19:30. Price 18-21 EUR, depending on the number of participants. The price includes traveling expenses and the dinner.

### **Gala Evening at the F. X. Šalda Theater (A. Dvořák: Requiem)**

At the gala evening of the F. X. Šalda Theater, Requiem by Antonín Dvořák will be performed. The performance starts at 19:00. Price 6 EUR.

## **TRANSPORTATION**

### **By car**

On June 4<sup>th</sup>, 2011, the transportation of IEEE ECMS 2011 participants from Liberec to Prague Ruzyně Airport by TUL cars will be organized depending on a request. The price will vary from 21 EUR (four persons in the car) till 85 EUR (a single person in the car) depending on the number of passengers.

### **By bus**

A regular bus transportation from Liberec to Černý Most, Prague is operated by Student-Agency company. Buses depart at 5:45 and then every hour until 19:45. The price is about 4 EUR and the on-line reservation at [www.studentagency.eu](http://www.studentagency.eu) is necessary.

A regular bus transportation from Liberec to Černý Most, Prague is operated by DMPLJ company. Buses depart at 7:30, 8:30 and then every two hours until 17:30. The price is about 4 EUR and the on-line reservation at [www.dmplj.cz](http://www.dmplj.cz) is necessary.

Other ways to get to the Prague Ruzyně Airport can be checked at <http://jizdnirady.idnes.cz/>

# Wednesday June 1, 2011

**8:30** **Opening Ceremony** **Hall AP12**

## **Invited Papers1**

**9:00** COURDESSES: A comparison of several approaches to perform a vision-based long range navigation

**9:30** WORLITZ: Active Magnetic Bearings - Product of Mechatronics

**10:00** Coffee Break

## **02-S1 Mechatronics/Advanced Control**

**Chairman: M. Courdesses**

**10:30** MALEK: Fuzzy Clustering of Independent Components within Time-Domain Blind Audio Source Separation Method

**10:50** LINDR: Inverse Dynamics Control Method Applied to the Standard Servo Control System to Suppress Mechanism Vibration

**11:10** GOMES: Stability of the Kalman filter for Markov Jump Linear Systems

**11:30** Lunch

## **03-S2 Mechatronics/Advanced Control**

**Chairman: M. Taix**

**13:00** BURES: The Problematic of the Production of 3D Copy Rotary Templates and 3D Work Pieces

**13:15** CRHAK: The Problematic of the Production Accuracy of Radial Cams

**13:30** MENKINA: Robust Control of Superheaters: Case Study

**13:45** OPALKA: Possibilities of Matlab Simulink model linearization

**14:00** Coffee Break

## **04-S3 Mechatronics/Advanced Control**

**Chairman: A. Richter**

**14:30** KOROTKA: Controllability of Non-square Linear Systems

**14:50** CHE: An intensity function for inclined multimode optical fiber sensors

**15:10** PAPOUSIDAKIS: Embedded Interface Implementation for a Nonlinear Motion System Control

**15:30** VOLEK: Reliability Comparison of Individual and Group Electric Drive

15:50 Break

**05-S4 Mechatronics/Advanced Control**

***Chairman: J.L. Boizard***

16:00 KUBIN: Consumption of the electric energy at tramway with resistors and transistors control

16:20 SKOLNIK: Optimal Control Structure of Infrared Heating System

16:40 CHLOUPEK: Test Pattern Compression Based on Pattern Overlapping and Broadcasting

19:00 Dinner: Canteen



# Thursday June 2<sup>nd</sup>, 2011

## Invited Papers 2

Hall AP12

- 8:30** DEVILLE: Spatial Sparsity-based Blind Source Separation Method including Non-negative Matrix Factorization for Multispectral Image Unmixing.

### 07-S5 Signal/Image Processing

*Chairman: P. Joly*

- 9:00** BOHAC: Automatic segmentation and annotation of audio archive documents
- 9:20 HORCICKA: Physical Properties Measurement on Nanofiber Images
- 9:40 CHALOUPKA: Automatic Video Segmentation for Czech TV Broadcast Transcription

- 10:00** Coffee Break

### 08-S6 Signal/Image Processing

*Chairman: Y. Deville*

- 10:30** LEGARDA: A New Method for Scheimpflug Camera Calibration
- 10:50 SALMAN: The Effect of Cluster Location and Dataset Size on 2-Stage k-means Algorithm
- 11:10 BEN KOUAS: Automatic Keyface Selection for Known People Identification in Images
- 11:25 BOIZARD: SOPC components for real time Image processing: Rectification, Distortion correction and Homography
- 11:45 AL-WOHAISHI: Comparison of M-PSK and M-QAM data using 3D Eye diagram for Carrier Recovery System

- 12:00** Lunch

## Invited Papers 3

- 13:00** NOGAREDE: Linear tubular switched reluctance motor for heart assistance circulatory
- 13:30 ROUCHON: Design a Power Inverter and Transformer for Piezoelectric Actuator

### 10-S7 Intelligent Materials and Devices

***Chairman: J. Nosek***

- 14:00 LINHART: Hysteresis measurements of lead-free ferroelectric ceramics  
BNBK79 (Bi<sub>0.5</sub>Na<sub>0.5</sub>)TiO<sub>3</sub>–(Bi<sub>0.5</sub>K<sub>0.5</sub>)TiO<sub>3</sub>–BaTiO<sub>3</sub>
- 14:15 SRB: Warming of Moulds by Infra Heaters
- 14:30 NOVAKOVA: Numerical simulation of mechanical behavior of a Macro  
Fiber Composite piezoelectric actuator shunted by a negative capacitor
- 14:45 MALYSH: Pulse poling of PZT ceramics
- 15:00 Coffee Break

**11-S8 Physics in Mechatronics**

***Chairman: P. Mokřý***

- 15:15 MAJI: A multiscale approach to phase reconstruction for Adaptive  
Optics
- 15:30 JASIKOVA: Experimental study of pneumatic full cone spray nozzle by IPI  
technique
- 15:50 ROUCHON: Experimental investigation on the properties of fluids  
subjected to high power ultrasonic waves : identification of perturbing  
parameters
- 19:00 Banquet: Zlaty Lev

## Friday June 3rd, 2011

### Selected Topics in Signal Processing (Invited)

Hall AP12

8:30 TAIK: Motion Planning with interactive devices

9:00 JOLY: Similarity between audiovisual contents

### 13-S9 Electronics, Data Processing

*Chairman: Z.Pliva*

9:30 DRAHONOVSKY: Guitar effects implementation in the FPGA circuits

9:50 NASREDDINE: Defects localisation tool for wireless sensors network conception

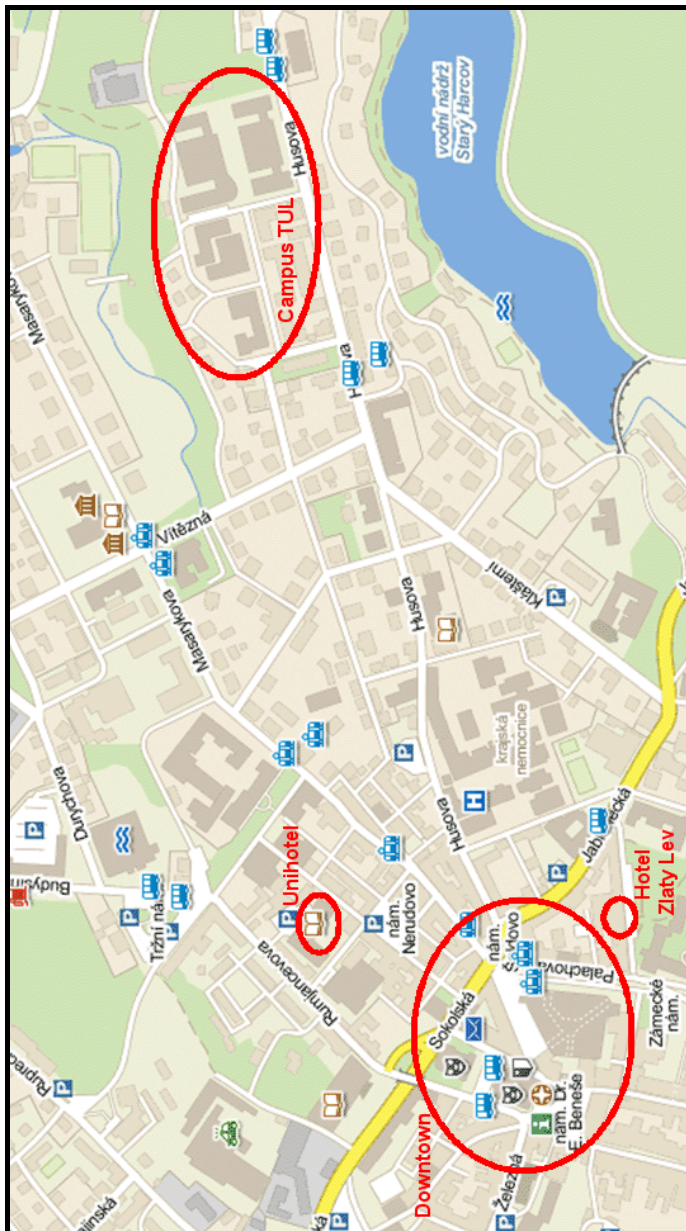
10:10 GRAILOO: Design of Robust, Energy-efficient Carry-Carrybar Circuits using Hybrid-CMOS logic style

10:30 PFEIFER: Fire detection safety system communication loop card with link layer coprocessor

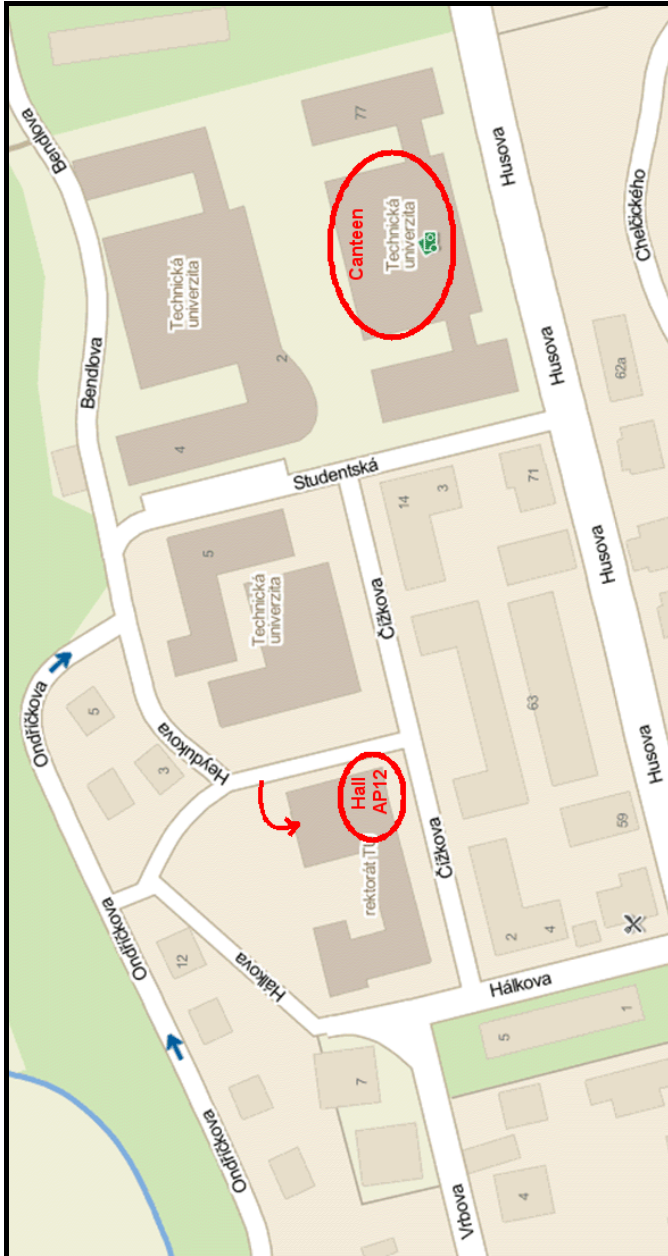
10:50 Coffee Break

11:20 Closing session

11:50 Lunch



Liberec Downtown, UNIHOTEL and Zlatý Lev



Main Campus of the Technical University of Liberec,  
Hall AP12 and Canteen

**STATISTICS**    **TOTAL NUMBER OF PAPERS: 62**

