

**Kaunas University of Technology  
Bialystok Technical University  
Vilnius Gediminas Technical University  
Opole University of Technology**

**7<sup>th</sup> International Conference  
Mechatronic Systems and Materials**

**MSM 2011**

**7 – 9 July, 2011, Kaunas, Lithuania**

**PROGRAMME**

## **AIM OF THE CONFERENCE**

The aim of the conference is to provide an opportunity to share the information and facilitate the co-operation in mechatronics and new materials and transfer of current research results in this multidisciplinary field.

## **CONFERENCE VENUE**

### **City of Kaunas**

Kaunas with nearly 350 000 inhabitants is one of the most significant cities of Lithuania. It is not only a city of old traditions, but also large centre of business and industry. It can also claim to be a city of young people with over 39,000 students studying at five state universities. Hundreds of years of cultural heritage are preserved in the historical and architectural monuments, museums, theatres, art galleries and churches of Kaunas.

### **Kaunas University of Technology**

Kaunas University of Technology is the largest technological university in the Baltic States. The University shares the best traditions of classical Universities, offering almost all fields of technological studies and research. The Social and Physical Sciences are being particularly emphasized at the University, as a modern University graduate is expected to bear much more beyond the knowledge of his profession. Meanwhile the studies and research in the fields of Humanities and Biomedicine, as well as in the interdisciplinary fields, have recently been very successfully launched. New study programmes in Mechatronics, Sport Engineering, Musical Engineering, and Biomedical Engineering appeared to be very popular among the students.

## **ABOUT MSM 2011**

The Scientific Editorial Committee of MSM 2011 has accepted 146 papers by authors coming from 15 countries. We would like to express our gratitude to the Scientific Editorial Committee members and reviewers for discussing and reviewing the papers, as well as for their contribution to the quality and success of the Conference.

Selected papers will be proposed for publication in a Special Issues of the International Journals: "*Journal of Vibroengineering*", "*Elektronika ir elektrotechnika (Electronics and Electrical Engineering)*", "*Mechanika*" and in other Scientific Journals of the Kaunas University of Technology.

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## MSM 2011 Conference Statistics

In October 2005, the 1<sup>st</sup> International Conference Mechatronic Systems and Materials was held in Vilnius, Lithuania. The successful first conference developed into the annual scientific event. Vilnius Gediminas Technical University, Opole University of Technology, Kaunas University of Technology and Bialystok Technical University are the organizers and hosts of the MSM conferences arranged in a different city each year:

- 1<sup>st</sup> – 2005, Vilnius, Lithuania,
- 2<sup>nd</sup> – 2006, Cracow, Poland,
- 3<sup>rd</sup> – 2007, Kaunas, Lithuania,
- 4<sup>th</sup> – 2008, Białystok, Poland,
- 5<sup>th</sup> – 2009, Vilnius, Lithuania,
- 6<sup>th</sup> – 2010, Opole, Poland,
- 7<sup>th</sup> – 2011, Kaunas, Lithuania.

## MSM 2011 Statistics by Country

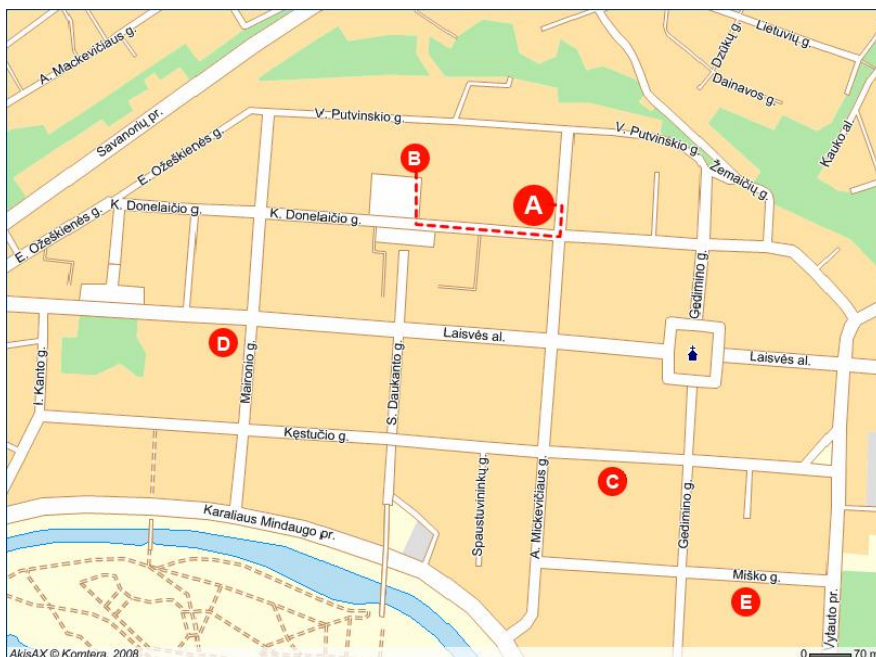
Country	Authors	Accepted papers (authors' input)
Belarus	7	1.50
Estonia	7	4.50
Finland	5	2.35
France	4	0.80
Germany	5	3.50
Hungary	1	1.00
Japan	3	0.65
Latvia	22	8.00
Lithuania	96	40.75
Poland	108	70.00
Romania	8	2.00
Russian Federation	9	5.00
Turkey	6	3.00
Ukraine	6	2.75
Bolivarian Republic of Venezuela	1	0.20
<b>Total:</b>	<b>293</b>	<b>146</b>

## MSM 2011 Statistics by Topic

<b>Topic</b>	<b>Accepted papers</b>
Adaptive Materials	1
Applications of Artificial Intelligence	3
Ceramics and Glasses	3
Integrated Diagnostics	3
New Trends in Mechatronics and Material Science Education	3
Functional Composites	4
Nanomaterials	4
Analysis of Signals	6
Tribology in Mechatronic Systems	7
Piezoelectric Materials	7
Failure Analysis	11
Multifunctional and Smart Materials	12
Robotics: Industrial, Microrobotics, Mobile Robots	15
Analysis of Vibration	18
Metallic Alloys	18
Optimization, Optimal Design	20
Measurement Techniques	26
Sensors and Actuators in Mechatronics	27
Control of Mechatronics Systems	29

Note. Some papers fall into several different topics.

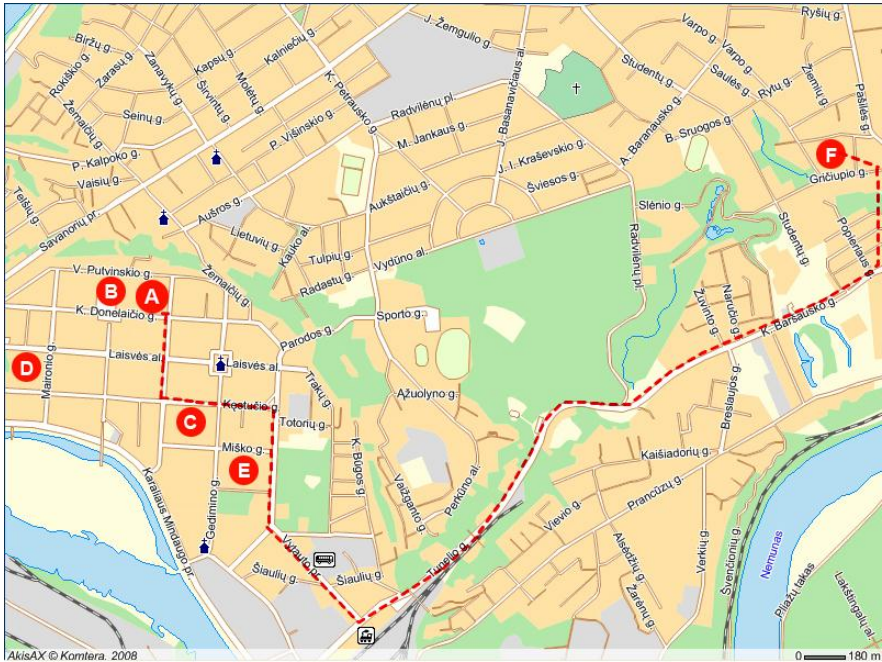
The MSM 2011 conference will take place in the town-Centre of Kaunas. All meeting places of the conference are located close to each other (please see the map below).



**Map of the town-centre of Kaunas**

- Point A:** Conference venue, A. Mickevičiaus str. 37.
- Point B:** Lunch and Evening Programme place, Restaurant GRAND CAFE, K. Donelaičio str. 62.
- Point C:** Department of Mechatronics,  
Faculty of Mechanical Engineering and Mechatronics,  
Kaunas University of Technology  
Kėstučio str. 27. Phone +370 37 300 900.
- Point D:** Kaunas Hotel, Laisvės alėja str. 79.
- Point E:** Europa Royale Kaunas Hotel, Miško str. 11.

The participants and guests of the Conference, staying at the KTU Dormitories, can find the locations of the MSM 2011 Conference using the map placed below.



**Map of the town-center of Kaunas with KTU Dormitories location**

- Point A:** Conference venue, A. Mickevičiaus str. 37.
- Point B:** Lunch and Evening Programme place, Restaurant GRAND CAFE, K. Donelaičio str. 62.
- Point C:** Department of Mechatronics,  
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Kęstučio str. 27. Phone +370 37 300 900.
- Point D:** Kaunas Hotel, Laisvės alėja str. 79.
- Point E:** Europa Royale Kaunas Hotel, Miško str. 11.
- Point F:** KTU Dormitories, A. Purėno str. 20.

**MSM 2011 PROGRAMME**  
**2011 07 06 (Wednesday)**

17:00-20:00	<b>Participants registration</b> (Mickevičiaus str. 37) <b>GET TOGETHER</b>
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**2011 07 07 (Thursday)**

9:00-10:00	<b>Registration</b> (Mickevičiaus str. 37)
10:00-10:05	<b>Opening of the Conference</b> <b>Chairman of MSM 2011 Ramutis BANSEVIČIUS</b>
10:05-10:10	<b>Welcome speech</b> <b>Rector of Kaunas University of Technology Petras BARŠAUSKAS</b>
10:10-11:20	<b>Keynote lectures:</b> <b>Jörg WALLASCHEK</b> <i>Leibniz University Hannover</i> <b>Rymantas Jonas KAŽYS</b> <i>Kaunas University of Technology</i>
11:20-12:00	<b>Coffee break</b>
12:00-13:30	<i>Section A1: Mechatronic Systems</i> <i>Room 1</i>
	<i>Section A2: Mechatronic Systems</i> <i>Room 2</i>
	<i>Section A3: Materials and Education</i> <i>Room 3</i>
13:30-14:45	<b>Lunch</b> Restaurant GRAND CAFE, K. Donelaičio str. 62
14:45-15:15	<b>Poster session 1</b>
15:15-15:30	<b>Coffee break</b>
15:30-16:30	<i>Section A1: Mechatronic Systems</i> <i>Room 1</i>
	<i>Section A2: Mechatronic Systems</i> <i>Room 2</i>
	<i>Section A4: Mechatronic Systems</i> <i>Room 3</i>
16:30-18:00	<b>Visits to (1<sup>st</sup> or 2<sup>nd</sup>):</b> 1. <i>Mechanical Engineering and Mechatronics faculty</i> or ; 2. <i>Electrical and Control Engineering faculty and</i> <i>Prof. Kazimieras Baršauskas Ultrasound Research Institute</i> <i>(please register for your chosen excursion (1<sup>st</sup> or 2<sup>nd</sup>) till 13:30)</i>
18:00-18:30	<b>Free time</b>
18:30-22:30	<b>Evening Programme</b> Restaurant GRAND CAFE, K. Donelaičio str. 62

**MSM 2011 PROGRAMME  
2011 07 08 (Friday)**

9:00-11:00	<i>Section B1: Mechatronic Systems Room 1</i>
	<i>Section B2: Mechatronic Systems Room 2</i>
	<i>Section B3: Materials Room 3</i>
10:30-11:00	<b>C o f f e e b r e a k</b>
11:00-12:45	<i>Section B1: Mechatronic Systems Room 1</i>
	<i>Section B2: Mechatronic Systems Room 2</i>
	<i>Section B3: Materials Room 3</i>
12:45-14:15	<b>L u n c h</b> Restaurant GRAND CAFE, K. Donelaičio str. 62
14:15-14:45	<b>Poster session 2</b>
14:45-15:00	<b>C o f f e e b r e a k</b>
15:00-15:15	<b>Closing of the Conference</b> <b>Chairman of MSM 2011 Ramutis BANSEVIČIUS</b>
15:15-17:00	<b>E x c u r s i o n i n K a u n a s</b> (on foot, starting point at A. Mickevičiaus str. 37)

**2011 07 09 (Saturday)**

9:00-18:00	<p><b>E x c u r s i o n s (1<sup>st</sup> or 2<sup>nd</sup>):</b></p> <p>1. <i>Kruonis Pumped Storage Plant a n d The Open Air exposition of the Lithuanian folk architecture of 19<sup>th</sup> – 20<sup>th</sup> centuries.</i></p> <p>2. <i>Vilnius and Trakai.</i></p> <p><i>Meeting point at A. Mickevičiaus str. 37; expected return at 18:00</i></p> <p><i>(please register for your chosen excursion (1<sup>st</sup> or 2<sup>nd</sup>) till Thursday, 13:30)</i></p>
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**DETAILED PROGRAMME  
of the MSM 2011**

**2011 07 07 (Thursday)**

**Plenary session**

9:00-10:00	<b>Registration</b> (Mickevičiaus str. 37)
10:00-10:05	<b>Opening of the Conference</b> <b>Chairman of MSM 2011 Ramutis BANSEVIČIUS</b>
10:05-10:10	<b>Welcome speech</b> <b>Rector of Kaunas University of Technology Petras BARŠAUSKAS</b>
	<b><u>Keynote lectures</u></b>
10:10-10:45	<b>Jörg WALLASCHEK</b> <i>Institute of Dynamics and Vibration Research (IDS), Leibniz University Hannover</i> Piezoelectric Systems for Ultrasonic Wire Bonding
10:45-11:20	<b>Rymantas Jonas KAŽYS</b> <i>Prof. Kazimieras Baršauskas Ultrasound Research Institute, Kaunas University of Technology</i> Application of Guided Waves and Long Range Ultrasonic Techniques for Non-Destructive Testing of Engineering Structures
	<b>Discussions</b>
11:20-12:00	<b>C o f f e e b r e a k</b>

**2011 07 07 (Thursday)**  
**Section A1: Mechatronic Systems**  
**Room 1**

- 12:00-12:15 Multi-Criteria Design Optimization of Micromirror Considering Technological Uncertainties  
**Adam Martowicz, Michal Manka and Tadeusz Uhl**
- 12:15-12:30 Investigation of Wear of Pneumatic Elements in Mechatronic Systems  
**Didzis Rags, Oskars Linins and Irina Boiko**
- 12:30-12:45 Determination of the Piezoelectric Coupling Coefficient for Arbitrary Deformation  
**Marcus Neubauer and Jörg Wallaschek**
- 12:45-13:00 Design of Alarm Processing Techniques and Tools for on-Line Monitoring of Mechatronic Systems  
**Antons Patlins, Alina Galkina, Nadezhda Kunicina and Yelena Chaiko**
- 13:00-13:15 Dynamical Flexibility of the Supported-Clamped Beam in Transportation  
**Slawomir Żółkiewski**
- 13:15-13:30 Spindle Position Control in an Active Journal Bearing using Ultrasonic Squeeze Film Levitation  
**Sebastian Mojrzisch, Kai-Alexander Saalbach and Jörg Wallaschek**

13:30-14:45 **L u n c h**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

14:45-15:15 **Poster session 1**

15:15-15:30 **C o f f e e b r e a k**

- 15:30-15:45 Semantics on Mobile Robot Algorithms Development  
**Raivo Sell and Sven Seiler**
- 15:45-16:00 Wood Products Automatic Identification Based on Fingerprint Method  
**Ahti Pölder, Mart Tamre and Märt Juurma**
- 16:00-16:15 Surface Roughness Characteristic of Elements Manufactured by Stereolithography Method  
**Stefan Dzionk and Włodzimierz Przybylski**
- 16:15-16:30 Research of Transformation Process of Power Stream Parameters in Independent Wind Turbine  
**Oksana Ganpanturova and Aleksandr Gubarev**

16:30-18:00 **V i s i t s t o**  
– **Mechanical Engineering and Mechatronics faculty;**  
– **Electrical and Control Engineering faculty a n d**  
**Prof. Kazimieras Baršauskas Ultrasound Research Institute**

18:00-18:30 **F r e e t i m e**

18:30-22:30 **E v e n i n g P r o g r a m m e**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

**2011 07 07 (Thursday)**  
**Section A2: Mechatronic Systems**  
**Room 2**

- 12:00-12:15 Trajectory Formation Methods for Mobile Piezobots  
**Ramutis Bansevicius, Asta Drukeleinienė and Genadijus Kulvietis**
- 12:15-12:30 The Rings with Molecular Current as the Model of the Passive Magnetic Bearing  
**Krzysztof Falkowski**
- 12:30-12:45 Upper Limb Active/Passive Exercisers – Two Different Approaches  
**Beniamin Chetran, Eموke Szelitzky, Alexandra-Maria Alutei and Dan Mandru**
- 12:45-13:00 Simulation of the Radiation Therapy System for Respiratory Movement Compensation  
**Tomas Krilavičius, Daiva Vitkutė-Adžgauskienė, Kęstutis Šidlauskas**
- 13:00-13:15 Roughness Parameters of Elastic Materials in Analysis of Measuring Errors  
**Anita Avišāne, Jānis Rudzītis and Viktors Gutakovskis**
- 13:15-13:30 Aerial Imagery Based Long-Range Path Planning for Unmanned Ground Vehicle  
**Robert Hudjakov and Mart Tamre**
- 13:30-14:45 **L u n c h**  
Restaurant GRAND CAFE, K. Donelaičio str. 62
- 14:45-15:15 **Poster session 1**
- 15:15-15:30 **C o f f e e b r e a k**
- 15:30-15:45 An Application of Mu-Synthesis to Control of a Small Air Vehicle – Simulation Results  
**Arkadiusz Mystkowski**
- 15:45-16:00 Reasons behind MEMS Energy Harvesting Employing Polyvinylidene Fluoride  
**Vytautas Ostaševičius, Ieva Milašauskaitė and Rolanas Daukševičius**
- 16:00-16:15 Introduction to Synthesis of the Torsional Vibrating Discrete-Continuous Mechatronic Systems by Means the Hypergraph and Structural Numbers Method  
**Andrzej Buchacz**
- 16:15-16:30 Investigation of Dynamics and Precision Characteristics of Low Frequency Vibration Measurement Device  
**Vitalijus Volkovas, Marija Eidukevičiūtė and Ernestas Uldinskas**
- 16:30-18:00 **V i s i t s t o F a c u l t i e s o f t h e K T U**
- 18:00-18:30 **F r e e t i m e**
- 18:30-22:30 **E v e n i n g P r o g r a m m e**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

**2011 07 07 (Thursday)**  
**Section A3: Materials and Education**  
**Room 3**

- 12:00-12:15 Integrated Concept for Embedded System Study  
**Raivo Sell and Sven Seiler**
- 12:15-12:30 Diagnostic Method of Measuring Hanger Rods Tension Forces in the Suspension of the Power Boilers Combustion Chamber  
**Jerzy Czmochowski, Eugeniusz Rusiński, Artur Górski and Michał Paduchowicz**
- 12:30-12:45 Numerical and Experimental Identification of Vibration Convection Chamber of Fluid Power Boiler  
**Michał Paduchowicz, Artur Górski and Jerzy Czmochowski**
- 12:45-13:00 Use of the ICT in Vocational Training in the Area of Industrial Robotics and Automation  
**Zbigniew Pilat, Tadeusz Goszczyński, Wojciech Klimasara, Marcin Slowikowski and Jacek Zieliński**
- 13:00-13:15 Object Protection by Foam Material  
**Joury Temis and Mikhail Birjoukov**
- 13:15-13:30 Testing composite Materials Connected in Bolt Joints  
**Sławomir Żółkiewski**

13:30-14:45 **L u n c h**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

14:45-15:15 **Poster session 1**

15:15-15:30 **C o f f e e b r e a k**

**Section A4: Mechatronic Systems**

- 15:30-15:45 Control Algorithms for Mechatronic Hydrostatic Bearings  
**Denis Shutin, Roman Polyakov and Leonid Savin**
- 15:45-16:00 Performance of Linear Electric Drive at Localizing of Dust Explosion  
**Roma Rinkevičienė, Zita Savickienė, Algimantas Juozas Poška**
- 16:00-16:15 Design of Piezobender Control of Electrohydraulic Servovalve  
**Dariusz Sędziak and Dominik Rybarczyk**
- 16:15-16:30 Control of a Small Robot by Haptic Joystick with Magnetorheological Fluid  
**Andrzej Milecki, Paweł Bachman and Marcin Chciuk**
- 16:30-18:00 **V i s i t s t o F a c u l t i e s o f t h e K T U**

18:00-18:30 **F r e e t i m e**

18:30-22:30 **E v e n i n g P r o g r a m m e**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

**2011 07 08 (Friday)**  
**Section B1: Mechatronic Systems**  
**Room 1**

- 9:00-9:15 Transients in the Electromagnetic Actuator with the Controlled Supplier  
**Bronislaw Tomczuk, Andrzej Waindok and Dawid Wajnert**
- 9:15-9:30 Fully Automated System for Air Velocity Profile Measurement  
**Roland Pawliczek and Miroslaw Kabacinski**
- 9:30-9:45 Application of Self-Oscillating System for Stress Measurement in Metal  
**Ireneusz Dominik, Janusz Kwasniewski and Krzysztof Lalik**
- 9:45-10:00 Hexapod Robot Kinematic Model  
**Tomas Luneckas and Dainius Udris**
- 10:00-10:15 Frequency Domain Identification of the Active 3D Mechancial Structure  
for the Vibration Control System  
**Andrzej Koszewnik and Zdzislaw Gosiewski**
- 10:15-10:30 Modeling and Design of a Flexure – Based Precision Positioning System  
**Giedrius Augustinavičius and Audrius Čereška**
- 10:30-11:00 **C o f f e e b r e a k**
- 11:00-11:15 Mechatronics Design of Small Type Computer Controlled Tensile Testing  
Machine  
**Riza Gürbüz**
- 11:15-11:30 Assisting Control Algorithms for Simplified Operation of Remotely  
Controlled Unmanned Ground Vehicle  
**Maido Hiimaa and Mart Tamre**
- 11:30-11:45 Design and Production of Biochip Robot  
**Atis Vilkajs, Sergejs Djacenko and Edgars Kovals**
- 11:45-12:00 Interactive Service Robot: Mechatronics for Elderly Assistance and  
Guiding Tasks  
**Sakari Pieskä, Mika Luimula and Jari Mäkelä**
- 12:00-12:15 The Robust Controller for the Bearingless Electric Motor with Permanent  
Magnets  
**Maciej Henzel**
- 12:15-12:30 Research of Physical Properties of Ferrofluid  
**Andrius Klevinskis and Vytautas Bučinskas**
- 12:30-12:45 Problems of Control and Safety in Aspect of Productivity and Reliability in  
the Automatic Line for Final Assembly of Fuse-Links  
**Zbigniew Pilat, Marek Grabiński, Wiesław Kopacz and Wojciech  
Klimasara**
- 12:45-14:15 **L u n c h**  
Restaurant GRAND CAFE, K. Donelaičio str. 62
- 14:15-14:45 **Poster session 1**

14:45-15:00 **C o f f e e b r e a k**

15:00-15:15 **Closing of the Conference**  
Chairman of MSM 2011 Ramutis BANSEVIČIUS

15:15-17:00 **E x c u r s i o n i n K a u n a s**  
(on foot, starting from A. Mickevičiaus str. 37)

**2011 07 08 (Friday)**  
**Section B2: Mechatronic Systems**  
**Room 2**

- 9:00-9:15 Calibration Machine for Linear Scales  
**Gyula Hermann**
- 9:15-9:30 In-pipe Inspection Microrobot with Adaptable Structure  
**Mihai Olimpiu Tătar, Claudiu Cirebea, Adrian Aluței and Vistrian Mătieș**
- 9:30-9:45 Applications of Location-Aware Robots and Transporters  
**Mika Luimula, Sakari Pieskä, Joni Jämsä, Itiro Siio and Mizuho Komatsuzaki**
- 9:45-10:00 Aeroelastic Self-Oscillations of Gas Seal Wall  
**Joury M. Temis and Alexey V. Selivanov**
- 10:00-10:15 Mechatronic Technologies in Bearing Units  
**Leonid Savin and Sergey Lavrushin**
- 10:15-10:30 Tribological Adhesion of Particles in an Acoustic Field  
**Vladas Vekteris, Vytautas Striška, Vadim Mokšin, Darius Ozarovskis and Rolandas Zaremba**
- 10:30-11:00 **C o f f e e b r e a k**
- 11:00-11:15 Fuzzy Logic Detection System of Water in Paper  
**İsmet Gucuyener**
- 11:15-11:30 A Platform for Selecting Materials for Mechatronic Systems  
**Rima Ben Mosbah, Sébastien Dourlens, Nicole Levy, Francisca Losavio and Amar Ramdane-Cherif**
- 11:30-11:45 Control of Six Phase Induction Drive  
**Benas Kundrotas, Saulius Lisauskas and Roma Rinkevičienė**
- 11:45-12:00 Indoor Positioning Using Symmetric Double-Sided Two-Way Ranging in a Welding Hall  
**Joni Jämsä, Mika Luimula, Sakari Pieska and Ossi Saukko**
- 12:00-12:15 Experimental Investigation of Interference Fit Connection of Mechanical Components  
**Bronius Bakšys and Jurgis Mikolainis**
- 12:15-12:30 Modeling and Diagnostic of Rotary System  
**Vytautas Barzdaitis, Pranas Mažeika, Artūras Tadžijevas and Jurgita Grigonienė**
- 12:30-12:45 Diagnostical Research of Rotor Systems with Variable Inertia Moment  
**Valentinas Kartašovas, Vytautas Barzdaitis, Pranas Mažeika and Marius Vasylius**
- 12:45-14:15 **L u n c h**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

14:15-14:45 **Poster session 2**

14:45-15:00 **Coffee break**

15:00-15:15 **Closing of the Conference**

Chairman of MSM 2011 Ramutis BANSEVIČIUS

15:15-17:00 **Excursion in Kaunas**

(on foot, starting from A. Mickevičiaus str. 37)

**2011 07 08 (Friday)**  
**Section B3: Materials**  
**Room 3**

- 9:00-9:15 Evaluation of Pedestrian to SUV Impact Kinematics – Lower Leg Impactor and Dummy Approach  
**Mariusz Ptak, Eugeniusz Rusiński and Jacek Karliński**
- 9:15-9:30 Analysis of Temperature Distribution in High Carbon Steel Wires Drawn with High Drawing Speed  
**Zbigniew Muskalski**
- 9:30-9:45 The Mathematical Model of the Dependent Fatigue Damage Zone  
**Vladislav Turko**
- 9:45-10:00 Investigation of Geometrical and Physical-Mechanical Parameters of Braille by Assessing Materials  
**Edmundas Kibirkštis, Ingrida Venytė, Volodymyr Mayik, and Diana Vakulich**
- 10:00-10:15 Mechanical Properties of Transparent Conductive Oxide Coating on Flexible Substrate  
**Inguna Strazdina, Edmunds Macevskis, Jānis Rudzītis, Toms Torims**
- 10:15-10:30 Dislocation Avalanches and Strain Bursts in the Boards of Radio-Engineering Equipment  
**Aleksandr Bogorosh, Nikolaj Višniakov, Jurij Novickij and Algimantas Bubulis**
- 10:30-11:00 **C o f f e e b r e a k**
- 11:00-11:15 The Comparison Analysis of Mechanical Properties and Fatigue Strength for Wires Made from TRIP Steel and from High Carbon Steel  
**Sylvia Wiewiórska**
- 11:15-11:30 Application of Electroplated Diamond Tools for Flat Grinding of Ceramics  
**Mariusz Deja**
- 11:30-11:45 Correlation between Shape Errors in Flat Grinding  
**Mariusz Deja**
- 11:45-12:00 Modern 3D Technologies for Orthodontic Application  
**Arūnas Lipnickas and Margarita Daukšienė**
- 12:00-12:15 Colour 3D Depth Map Building Using Camera with 2D Laser Scanner  
**Arūnas Lipnickas and Kęstas Rimkus**
- 12:15-12:30 Design and Research of the Laser Trainer with the all Functions G-36 Weapon  
**Algimantas Fedaravičius, Laima Patašienė, Minvydas Ragulskis, Egidijus Šližys and Arvydas Survila**
- 12:30-12:45 Magneto-Rheological Fluid Mixing Using Ultrasound  
**Egidijus Dragašius, Darius Mažeika, Vytautas Jūrėnas and Viktorija Mačiukienė**

12:45-14:15 **L u n c h**  
Restaurant GRAND CAFE, K. Donelaičio str. 62

14:15-14:45 **Poster session 2**

14:45-15:00 **C o f f e e b r e a k**

15:00-15:15 **Closing of the Conference**  
Chairman of MSM 2011 Ramutis BANSEVIČIUS

15:15-17:00 **Excursion in Kaunas**  
(on foot, starting from A. Mickevičiaus str. 37)

**POSTER SESSION 1 (2011 07 07, Thursday)**  
**Section: Mechatronic Systems**

Methodology of Conceptual Design with the Use of TRIZ and DFSS  
**Sebastian Koziolok, Tadeusz Smolnicki and Mateusz Slupinski**

Agent-Based Methodology for Intelligent Mechatronic Devices  
**Laura Kizauskienė, Rimvydas Gaidys and Egidijus Kazanavičius**

Heuristic Methods: a Key to Inventive Design  
**Sebastian Koziolok and Tadeusz Smolnicki**

Structural Determinants Maximising Wear Resistance of Friction Joints  
**Wojciech Zurowski**

Methods of Identifying Plastic Wear of Large-Size Bearing Tracks  
**Tadeusz Smolnicki and Sebastian Koziolok**

The Analysis of the Control System for the Bearingless Induction Electric Motor  
**Mariusz Żokowski, Maciej Henzel and Krzysztof Falkowski**

Mechatronic System of the MZGS-200E Stand for Fatigue Tests under Variable Amplitude Non-Proportional Bending with Torsion  
**Henryk Achtelik, Zbigniew Marciniak, Dariusz Rozumek, Ewald Macha, Cyprian Lachowicz and Czesław Marciak**

Determining the Torsional Natural Frequency of Underframe of off-Road Vehicle with Use of the Operational Modal Analysis Procedure  
**Mariusz Kosobudzki and Krzysztof Jamroziak**

Field-Circuit modeling of AMB System under Various Rotational Speed of the Rotor  
**Jan Zimon, Bronisław Tomczuk and Dawid Wajnert**

Active Synthesis of Machine Drive Systems Using a Comparative Method  
**Tomasz Dzitkowski and Andrzej Dymarek**

Analysis of Composite Beam with Piezoelectric Actuator Based on the Approximate Method  
**Andrzej Buchacz and Marek Placzek**

Utilization of Advanced Self-diagnostic Functions Implemented in Frequency Inverters for the Purpose of the Computer-Aided Identification of Operating Conditions  
**Mariusz Hetmańczyk, Jerzy Świder and Piotr Michalski**

Extended Diagnostic System for Earth Fault, Duplicate Address Detection and Noise Detection in AS-Interface Networks  
**Piotr Michalski, Jerzy Świder and Mariusz Hetmańczyk**

Investigation of Dissipative Properties of Liquid Crystalline Lubricant Layer  
**Vadim Mokšin, Artūras Kilikevičius and Vladas Vekteris**

Synthesis in a Designing of Mechatronics Vibrating Mixed Systems  
**Andrzej Buchacz and Damian Gałęziowski**

Kelvin Voigt Model of Single Piezoelectric Plate  
**Andrzej Wróbel**

Review of the New Technological Developments from the Lightning of the Electric Network of Isolated Neutral

**Dovilė Sakauskaitė and Arūnas Lipnickas**

Optical Focusing Method of Laser Beam for Measuring Qualitative Parameters Marks of Disc of the Angular Sensor

**Vladas Juška, Edgaras Vaštakas and Edvardas Ibenskis**

Measuring Parameters of the Material Surface Using Method: the Feasibility Study

**Vladas Juška, Tomas Gadišauskas and Vytautas Dumbrava**

Design of the Piezoelectric Actuator with Two Directional Polarizations for Controllable Multi-DOF Oscillations

**Raimundas Lučinskis, Dalius Mažeika and Ramutis Bansevicius**

## **POSTER SESSION 1 (2011 07 07, Thursday)**

### **Section: Materials**

A Study on Biocompatibility of Steel 316L in Plasma (Human Body Liquid) by Using Biomedical Engineering Approach

**Ahmet Çoşgun, Cemal Okuyan, Nafel Dogdu and Umit Yalcin**

Numerical Modelling of the Flat Bars Rolling Process with Dimensions 190x6 mm in Cutting-Bent Grooves with the Affected Widening

**Tomasz Skura, Sebastian Mróz and Henryk Dyja**

Description of a Composite Material Deformation by the Degenerated Model Consisting of Nonlinear Elastic Element

**Jamroziak Krzysztof**

Inventive Design and Tile Glazing Process

**Sebastian Koziol, Mateusz Slupiński and Mariusz Ptak**

Application of Thermovision Technique for the Investigation of Influence of Temperature Change on the Metallic Charge Length on the Energy and Force Parameters during Industrial Plain Round Bars Rolling Process

**Konrad Laber, Piotr Sygut, Sebastian Mróz and Henryk Dyja**

Analysis of the Deep Drawability of M63 and M70 Brass Strips

**Anna Kawalek, Henryk Dyja and Sebastian Mróz**

Numerical Analysis of the Microstructure Change During Flat Bars Normalizing Rolling Process

**Andrzej Stefanik, Piotr Szota, Sebastian Mróz and Henryk Dyja**

Physical and Numerical Modelling of Cu-Al Bimetallic Rods Rolling Process

**Sebastian Mróz, Piotr Szota, Anna Kawalek and Andrzej Stefanik**

Method of Active Synthesis of Discrete Restrained Mechanical Systems

**Andrzej Dymarek and Tomasz Dzitkowski**

Application of Object-Oriented Methods to the Modeling Composite Structural Elements

**Andrzej Baier and Michał Majzner**

The Analysis of Phase Transformation in Experimental Complex-Phase Steel during Continuous Cooling after Hot Deformation

**Justyna Rapalska, Henryk Dyja and Bartosz Koczurkiewicz**

The Influence of Rolling Process Parameters and Lengthening Grooves Shape on Closing Internal Material Discontinuities

**Kamila Sobczak and Henryk Dyja**

Influence of Erosive Particles Impact Energy on Epoxy Coatings Wear Intensity

**Andrzej Kotnarowski and Grzegorz Wronka**

Effect of Epoxy and Polyurethane Coating Modification with Nanofillers on Their Resistance to Erosive Wear

**Danuta Kotnarowska, Michał Przerwa and Małgorzata Wojtyniak**

Mechatronic System for Technical Diagnostic Using Barkhausen Effect

**Tomasz Garstka**

Ultrasonic Systems for Liquid Pulverizer

**Piotr Vasiljev**

Ultrasonic Cavitations Research in Flowing Liquids, with Low Depth of Duct

**Piotr Vasiljev, Regimantas Bareikis and Arūnas Struckas**

Automotive Sensors Investigation for Future Development Possibilities

**Julius Barzdžiukas and Saulius Jačėnas**

## **POSTER SESSION 2 (2011 07 08, Friday)**

### **Section: Mechatronic Systems**

Research of Electric Motor-Generator Vibrations

**Remigijus Jonušas, Egidijus Juzėnas and Kazimieras Juzėnas**

Mechanical and Electrical Elements in Reduction of Vibrations

**Katarzyna Bialas**

The Application of Wavelets in Vector Quantization of Polish Speech

**Miroslaw Tarasiuk and Zdzislaw Gosiewski**

Deformation of Details Projection of Components Created by Rapid Prototyping Method

**Stefan Dzionk**

Flexible Control for the Discrete Systems, Presented in the Form of Cyclic Modules

**Aleksandr Gubarev, Oleg Yakhno and Oksana Ganpanturova**

Evaluation of Dynamics of Robotic System Operating in Heavy Loaded High Speed Conditions

**Mantas Štrimaitis, Robertas Urbanavičius, Artūras Kilikevičius, Mindaugas Jurevičius, Vytautas Striška and A Trumpa**

Evaluation of the Resistance Force of Magnetorheological Fluid Damper

**Anatolijus Šulginas, Darius Mažeika, Vytautas Grigas and Egidijus Dragašius**

Parts Placement and Orientation on Metal Sheet Influence Analysis in Punching Processes  
**Inga Skiedraitė, Dovilė Kaževaitė and Alyudas Kondratas**

Presentation the Concept of Stability of the Hybrid Powertrain by the Lyapunov Theory  
**Andrzej Nierychlok and Gabriel Kost**

Biomedical Signal Identification and Analysis  
**Agata Nawrocka and Marcin Nawrocki**

The Concept of Transducer for Detection of Trackway Surface Condition Basing on Frictional Coupling of Wheel With a Rail and its Experimental Verification  
**Andrzej Niedworok, Andrzej Baier and Łukasz Orzech**

Experimental Research of Dynamic Damping of Rigid Beam Transversal Vibration  
**Svetlana Polukoshko, Olga Kononova and Igor Schukin**

Balance Platform System Dynamic Properties  
**Andrzej Kot and Agata Nawrocka**

Optimization of Control of Automatic Assembly Process of Parts with Cylindrical Shape  
**Natalija Mozga and Ivan Grinevichs**

Accelerometer Model Substitute for Applications in Modelling  
**Vincas Benevičius, Vytautas Ostaševičius, Rimvydas Gaidys and Mantas Venslauskas**

Investigation of Control Signal of Tactile Device with Electromagnet  
**Ramutis Bansevicius, Marius Gudauskis and Arūnas Žvironas**

Dynamic Analysis of Vibratory Assembly Process under Passive Compliance  
**Bronius Bakšys and Jolanta Baskutienė**

The Robust Estimation of Stochastic Models in the Questions of Diagnostics of Mechanical Systems  
**Alexander Tyrsin, Lev Sokolov and K. E. Maksimov**

Relationships between Railroad Noise and social-economic factors  
**Danielius Gužas**

## **POSTER SESSION 2 (2011 07 08, Friday)**

### **Section: Materials**

Scanner Dynamics Control using Magnetorheological Fluid  
**Egidijus Dragašius, Viktorija Mačiukienė, Vytautas Jūrėnas, Sigita Navickaitė, Algimantas Bubulis and Ramutis Bansevicius**

Investigation of Magneto-Rheological Fluid Parameters using Cantilever Type Piezo Actuator  
**Egidijus Dragašius, Viktorija Mačiukienė, Sigita Navickaitė and Vytautas Jūrėnas**

Influence of the Non-Uniform Temperature Distribution on the Metallic Charge Length on Dimensional Accuracy Round Bars  
**Piotr Sygut, Sebastian Mróz and Konrad Laber**

NiSi vs NiPdSi as Possible Interconnect and Electrode Materials for FBARs and MEMS  
**Aliksandra Karabko and Egidijus Dragašius**

Improvement of the Quality of Protective-Decorative Coatings by Modifying Them with Nanoadditives

**Eugenia Korobko, Anatoly Sviridenok, Natallia Bedik, Alexander Bartashevich, Ludmila Ignatovich and Sergey Shetko**

Analysis of the Global Stability of the Aluminium Foam Stand-Alone Energy Absorber  
**Artur Iluk**

Using the High-Speed Camera as Measurement Device in the Dynamic Material Tests  
**Artur Iluk**

Fracture Analysis of the Feeder Load Carrying Structure in the Caterpillar Girder and Steering Frame Connection Area

**Eugeniusz Rusiński, Jerzy Czmochowski and Paweł Kaczyński**

Investigation of the Structure and Mechanical Properties of the GX40NiCrNb45-35 Cast Steel After Treatment of High Temperature

**Raimondas Skindaras, Algirdas Vaclovas Valiulis, Wojciech L. Spsychalski**

The Influence of Ageing Process on Microstructure and Mechanical Properties of GX12CrMoVNB9 -1 (GP91) Cast Steel

**Grzegorz Golański and Paweł Wiczorek**

Precipitation Process in VM12 Steel after Ageing at 650°C Temperature

**Joanna Kępa, Grzegorz Golański, Adam Zieliński and Alina Brodziak-Hyska**

Residual Stress in a Thin-Film Micro-Opto-Electromechanical (MOEMS) Membrane

**Karolis Malinauskas, Vytautas Ostaševičius, Rolanas Daukševičius and Viktoras Grigaliūnas**

The Analysis of Deformability the Bimetal Plates Al99.8-M1E get by Explosive Welding Method

**Dariusz Rydz, Teresa Bajor, Marlena Krakowiak, Robert Skoblik and Krzysztof Korn**

Resistance to Cast Iron Seizure Determined by the Technological Condition of the Surface Layer

**Stanisław Laber and Alicja Laber**

Tribological Properties of Porous Sinters

**Alicja Laber**

The Investigation of Chosen Properties of High Dispersion Padding Welds Produced by the Laser Technique of Designed on Units Machine Engines about Raised Resistance to Waste under Friction

**Wojciech Napadlek and Agnieszka Laber**

Laser Ablation in the Car Varnishing Coats Analysis

**Wojciech Napadlek and Izabela Kalman**

Formation Technological Surface Layer Strokes Cylinder Liner by using a Laser Ablation Micromachining

**Wojciech Napadlek**

## ABOUT THE EXCURSIONS

### Excursion 1 - Trip to Kruonis Pump Storage Power Plant and Rumšiškės

During this trip, you will be able to see Kruonis Pump Storage Power Plant (Kruonis PSHP) and open-air ethnographic Museum – Rumšiškės.

Kruonis PSHP was constructed as a main auxiliary power supply system for the peak energy demands. Its basic functions: balancing of electricity generation, consumption and preventing accidents in the power system.



In past it was primary used to eliminate the capacity deficit in the event of disconnection of Ignalina Nuclear Power Plant (INPP), PSHP artificial reservoir volume is 48.78 million m<sup>3</sup>, installed capacity of the pumped storage plant: 900 MW (four units, 225 MW each), maximum discharge at turbine mode 226 m<sup>3</sup>/s. Kruonis PSHP is the only hydro power plant of such type in Baltic states.

Another object that we will pass by is one of the largest ethnographic museums in Europe – an open-air ethnographic Museum – in Rumšiškės. It is located on the right bank of the river Nemunas and displays the heritage of Lithuanian rural life in a vast collection of authentic resurrected buildings. The total area of 175 ha contains 140 buildings from the 18<sup>th</sup>–20<sup>th</sup> century with the restored original interiors and surroundings. This museum was established to help to preserve and research the former ways of living. The buildings of this museum are exposed as farmsteads and represent the main ethnographic regions of Lithuania: Aukštaitija, Žemaitija, Dzūkija and Suvalkija. The open-air museum stores the most valuable examples of Lithuanian farmsteads.

### Excursion 2 - Trip to capital city of Lithuania Vilnius and Trakai

During this trip, you will be able to see medieval capital of Lithuania Trakai and present capital – Vilnius.

Trakai is an ancient capital of Lithuania, situated 25 km south from Vilnius. The famous Trakai Castle occupies one island of Lake Galvė. Trakai was the second capital of Lithuania during the sovereignty of brothers Kęstutis and Algirdas.



Vilnius is one of European capital cities at the crossroads between West and East, South and North. This special position is reflected not only by the variety of its architectural styles, but also by the spirit of the city.

Vilnius is situated on the confluence of two rivers: Neris and Vilnelė. Major institutions of Lithuania: the Seimas (Parliament), the Presidency, the Government and etc. are located in Vilnius. The population of Vilnius is just over half a million (554,000). The heart of Vilnius is built around certain hills, including one with basic architectural symbol of Lithuania – the tower of Gediminas' Castle. Currently Vilnius is one of the most visited cities in Eastern Europe. In 1994 the Old Town of Vilnius was included in the UNESCO World Heritage List. In the narrow old streets one will see numerous pieces of historical heritage, like St. Anna's Church, St. Peter-Paul Church.





