

Joint Program

Saint Petersburg, State Politechnical University

Russia, September 23-25, 2014



**2014 International Conference on Mathematical Models and
Methods in Applied Sciences (MMMAS '14)**

**2014 International Conference on Economics and Applied
Statistics (EAS '14)**

**2014 International Conference on Circuits, Systems and Signal
Processing (CSSP '14)**

**2014 International Conference on Communications and
Computers (CC '14)**

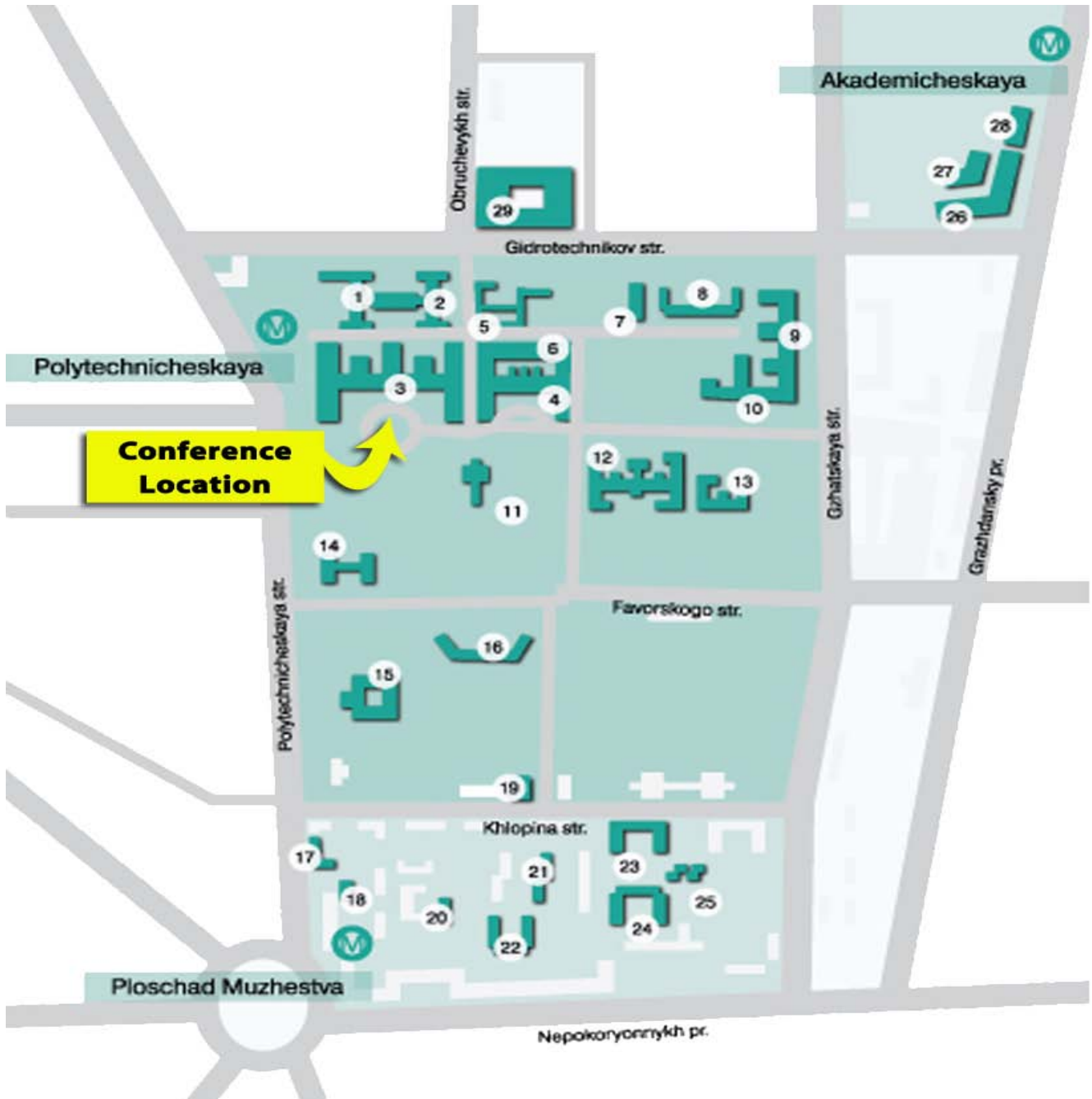
**2014 International Conference on Energy, Environment and
Material Science (EEMAS '14)**

Important Notes:

- (1) You may register at any time during the conference.
- (2) The Invoice of payment can be collected at the registration desk at any time.
- (3) The Certificate of Participation can be collected at the registration desk only after your presentation.
- (4) Session chairmen can ask for a special Certificate at the registration desk after the session
- (5) The duration of a presentation slot is 20 minutes for a regular paper, 30 minutes for an invited paper and 45 minutes for a plenary speech, including questions. Invited papers are marked in *Italic letters*
- (6) All authors should give their biographies to the chairmen before the beginning of the session.
- (7) Authors can upload their presentations to the available computers 10 minutes before the beginning of their session.

Conference Location:

State Polytechnic University
29 Polytechnicheskaya Str., 195251, St. Petersburg, Russia
Main University Building



Conference Registration Desk: Ground Floor
Room 118: Ground Floor
Room 235: 2nd Floor

UNIVERSITY CAMPUS

- 1st University Building
Institute of Applied Mathematics and Mechanics
Institute of Metallurgy, Mechanical Engineering and Transport
- 2nd University Building
Institute of Physics, Nanotechnology and Telecommunications
- Main University Building
Institute of Humanities
Institute of Energy and Transport Systems**
- Chemistry Building
Institute of Metallurgy, Mechanical Engineering and Transport
- Mechanics Building
- 4th University Building
- Laboratories Building
- 3rd University Building
Institute Industrial Economics and Management
- Annex to Hydro Building
Institute of Construction Engineering
- Hydro Building
Institute of Military Education and Safety
- Hydro Tower Building
- 2nd Residence
- House of Scientists
- 1st Residence
- Sporting Complex
- Center of Science PhTI-SPbSPU
- 9th University Building
Institute Computing and Control
- Institute of Applied Linguistics
- Laser Technologies Center
- Student's Hostel №7
- Student's Hostel №8
- Student's Hostel №10
- University Clinic
- Student's Hostel №14
- Student's Hostel №12
- Institute of International Educational Programs
International Office of SPbSPU
Admission Office
- New Study Building
International Education & Science
Supply Center
- International Student's Hostel
- Retraining Faculty

Registration: 08:30-09:15

Plenary Lecture 1: 09:15-10:00 ROOM 118'



Stiff Models and Gradient Methods with the Exponential Relaxation

by Prof. Igor G. Chernorutskiy, Saint Petersburg State Polytechnical University, Russia.

Plenary Lecture 2: 10:00-10:45 ROOM 118'



EMG-Analysis for Enhancing Efficiency and Performance of Electric Power Systems by Using Smart Grid Technology

by Prof. Nikolay V. Korovkin, Saint Petersburg State Polytechnical University, Russia.

Coffee Break: 10:45-11:15

Plenary Lecture 3: 11:15-12:00 ROOM 118'



Modeling of Mechanism of State and Private Partnership Development of the Social Infrastructure in the Regions

by Prof. Vladimir V. Gluhov, Saint Petersburg State Polytechnical University, Russia.

EUROPMENT CONFERENCES: Tuesday September 23rd 2014

CONFERENCE ROOM 118': 12:00-14:30

MMMAS Session: Systems Science and Scientific Computation

Chair: Alexander Kolnogorov, Charkaz Aghayeva

<i>Robust Normal Two-Armed Bandit and Parallel Data Processing</i>	<i>Alexander V. Kolnogorov</i>	<i>5198003</i>
On Improvement of Fault-Tolerance in Distributed Hardware-Software Multi-Agent Systems and Assessment of Assured Reliability	Alexei V. Igumnov, Sergey E. Saradgishvili	5204003
Necessary Conditions of Optimality for Stochastic Switching Systems With Delay	Charkaz Aghayeva	5190003
Tangency-Saddle Singularities of Planar Bimodal Linear Systems	Josep Ferrer, Marta Pena, Antonio Susin	5222011
Method of Unbalanced Power Minimization in Three-Phase Systems	Korovkin Nikolay, Quang Sy Vu, Yazenin Roman, Frolov Oleg, Silin Nikolay	5230011
Computer Simulation of Hybrid Systems by ISMA Instrumental Facilities	Yu. V. Shornikov, M. S. Myssak, D. N. Dostovalov	5289003
Dynamic Response of a Hereditarily Elastic Beam with Rabotnov's Kernel Impacted by an Elastic Rod	Yury A. Rossikhin, Marina V. Shitikova, Ivan I. Popov	5229007

EUROPMENT CONFERENCES: Tuesday September 23rd 2014**CONFERENCE ROOM 235': 12:00-14:30****EAS Session: Economics and Applied Statistics****Chair: Igor Ilin, Evgenii Artemenko**

Social Investments of Russian Business: Problems and Prospects	Anna B. Teslya	5213015
An Economic and Mathematical Approach to Determining Key Product Quality Parameters when Placing a State Defense Order	E. S. Artemenko	5216007
Improvement of Strategic and Operational Efficiency of Clusters Based on Enterprise Architecture Model	Igor V. Ilin, Aleksei B. Anisiforov	5218003
The Application of Discriminant Analysis for Estimation of the Regional Investment Attractiveness	Izotov Aleksandr, Rostova Olga	5194003
Social Return Valuation by Means of Linear and Nonlinear Transformation Methods in Income Taxation	Kalinina Olga	5221003
Decision-Making Support Tools in Data Bases to Improve the Efficiency of Inventory Management for Small Businesses	Svetlana V. Shirokova, Oksana Y. Iliashenko	5232007
A Macroeconomic Model of Consumption and Investment Spending: An Econometric Application for the Economy of Cyprus	Panayiotis Diacos	5112003
Dynamics of Financial Market Stability Factors in Terms of Financial Globalization	Rustam R. Akhmetov	5147003
Quantification of Selected Factors of Longevity	V. Pacáková, P. Jindrová	5234019

Coffee Break: 14:30-15:00

EUROPMENT CONFERENCES: Tuesday September 23rd 2014

CONFERENCE ROOM 118': 15:00-17:00

MMMAS Session: Differential Equations and Applications

Chair: Eugeny Novikov, Alexander Kalimov

Eddy Currents Computation by an Integral Equation Method	A. Kalimov, S. Shimansky	5229003
(M, 2)-Methods of Accuracy of a Maximal Order for Stiff Systems	Eugeny A. Novikov	5286003
Variable Structure Algorithm Using Explicit and L-Stable Methods	Eugeny A. Novikov, Anton E. Novikov	5207007
Gradient Methods with the Exponential Relaxation	Igor G. Chernorutskiy	5218011
The Mathematical Model of the Dynamics of Bounded Cartesian Plumes	Khaled S. Al-Mashrafi	5035003
Higher Symmetries and Inverse Problems for Ordinary Differential Equations	Valentin Zaitsev, Lidiya Linchuk, Alexander Flegontov	5200007

CONFERENCE ROOM 235': 15:00-17:00

EEMAS Session: Power and Energy Systems

Chair: Liudmila Sakhno, Nikolay Korovkin

Modeling of Grounding Systems of Power Lines under Pulse Influence	Kirill I. Netreba, Nikolay V. Korovkin, Nikolay V. Silin	5231019
Enhancement of Escalator Energy Performance with the Use of Double-Fed Engines	Korzinin N. M., Korovkin N. V., Silin N. V.	5235007
Mathematical Model for Calculation of Power Consumption and Electromagnetic Noise of Resistance Welding Machines	L. Sakhno, O. Sakhno, S. Dubitsky	5232023
Redundant Generating Supply in Electric Power Systems	Nikolay A. Belyaev, Nikolay V. Korovkin, Oleg V. Frolov, Vladimir S. Chudny	5228003
Application of Multiobjective Optimization Methods for Power System State Control	Nikolay V. Korovkin N., Mikhail V. Odintsov, Dmitry A. Akimov, Oleg V. Frolov	5232019
Multiphysics Finite Element Analysis of Underground Power Cable Ampacity	Simon Dubitsky, George Greshnyakov, Nikolay Korovkin	5235003
Stand for Testing Asynchronous Machine with Wound Rotor	S. German-Galkin, V. Tomasov, A. Egorov	5226003

EUROPMENT CONFERENCES: Tuesday September 23rd 2014

POSTER PRESENTATIONS

A Soft Clustering Approached with Feature Reduction using Principal Component Analysis	Phichete Julrode	4901007
Robust-Adaptive Algorithm of Computer Electromagnetic Protection	V. A. Rusanov, R. A. Daneev, A. E. Kumenko, V. N. Sizykh	4916003
Structural-Parametric Identification of Differential Equations of the Elastic Element of Satellite-Gyrost	V. A. Rusanov, L. V. Antonova, A. V. Daneev, A. E. Kumenko	4916007
New Method Based on a Speech Processing Algorithm for Cochlea Implants Using IIR Filters	Hajer Rahali, Zied Hajaiej, Noureddine Ellouze	4968003
Chebyshev Polynomials in Free Vibration Analysis of Functionally Graded Annular Plates Resting on Foundation	Y. Kumar	4997007
Hand Gesture Recognition Using 1\$ and Background Subtraction Algorithms	Hazem Khaled, E. M. Saad, S. Sayed, Hossam Ali	5057003
Conversion of the METCM into the METEO-11	Karel Silinger, Ladislav Potuzak, Jiri Sotnar	5074011
Distress Situation Detection Based Data Fusion Analysis for HSH	Mohamed Fezari, Leila Abdoune, Ali Al-Dahoud	5146011
Financial Risks of Constituents of the Russian Federation	Sabitova Nadia Mikhailovna, Shavaleyeva Chulpan Mansurovna	5176051
Numerical Simulation and Modeling of Unsteady Flow around an Airfoil (Aerodynamic Shape)	Madani Y. H., Bensaada M., Rached D.	5185107
Voice Analysis for Detecting Persons with Parkinson's Disease Using MFCC and VQ	A. Benba, A. Jilbab, A. Hammouch	5201007

Plenary Lecture 4: 09:00-09:45 ROOM 118'



On Complete Monotonicity of Some Functions of the Mittag-Leffler Type in Non-Debye Relaxation Processes
by Prof. Francesco Mainardi, University of Bologna, Italy.

Plenary Lecture 5: 09:45-10:30 ROOM 118'



From Physical to Mathematical Circuits: Theoretical and Practical Issues
by Prof. Massimo Ceraolo, University of Pisa, Italy.

Coffee Break: 10:30-11:00

CONFERENCE ROOM 118': 11:00-13:00

MMMAS Session: Simulation, Modeling and Optimization

Chair: Andrey Savchenko, Natalia Ampilova

Radial-Basis Functions Neural Network for Text Independent Speaker Recognition	A. A.Yakovenko, G. F. Malyhina	5234015
<i>Piecewise-Regular Object Recognition in Real-Time Applications</i>	<i>Andrey V. Savchenko, Vladimir R. Milov</i>	<i>5281003</i>
On a Method of Texture Analysis	Natalia B. Ampilova, Igor P. Soloviev	5210007
Simulation of Emission Spectra for LH2 Ring: Fluctuations in Radial Positions of Molecules	Pavel Herman, David Zapletal, Pavel Kabrhel	5153007
Integrated Technology for Industrial Software Verification and Testing	V. Kotlyarov, P. Drobintsev, I. Nikiforov	5226011
The Procedure of Image Identification as a Method of Raising Consumer Demand	Yakovlev Andrey Anatolyevich	5212003
Dynamic Response of a Doubly Curved Shallow Shell Rectangular in Plan Impacted by a Sphere	Yury A. Rossikhin, Marina V. Shitikova, Muhammed Salih Khalid J. M.	5242003

EUROPMENT CONFERENCES: Wednesday September 24th 2014

CONFERENCE ROOM 235': 11:00-13:00

CSSP-CC Session: Image, Sound and Signal Processing

Chair: Hafez Fouad, Yeon-Ho Chung

Continuous Health-Monitoring for Early Detection of Patient by Web Telemedicine System	Hafez Fouad	5203003
Shore-to-Sea Maritime Communication with Visible Light Transmission	Hyeongji Kim, Atul Sewaiwar, Yeon-Ho Chung	5228007
<i>Stochastic Model for Local Ice Loads, Measured on the Vessel Hull</i>	<i>Petr Zvyagin</i>	<i>5310011</i>
Disturbances Applied to Axis of Telescope Installed on the Deck of a Ship	S. A. Tushev, V. N. Drozdov	5200011
New Way of Digital Processing of Short Noisy Signals	V. Tutygin	5063007

CONFERENCE ROOM 118': 13:00-15:00

MMMAS Special Session: Mathematical Modeling in Applied Sciences

Chair: Francesco Mainardi

Nonlinear Heat Conduction Problem in Doubly Periodic 2D Composite Materials	Marina Dubatovskaya, Gennady Mishuris, Sergei Rogosin	5289015
General Theory for Reproducible Data Processing: Apparatus Function and Reduction to an "Ideal" Experiment	R. R. Nigmatullin, D. Striccoli, W. Zhang	5288003
Fractional Model of Electron Diffusion in Dye-Sensitized Nanocrystalline Solar Cells	R. T. Sibatov, V. V. Svetukhin, V. V. Uchaikin, E. V. Morozova	5292007
Fractional Viscoelastic Model of the Tooth Root Displacements in "Noncompensable" Periodontal Ligament	Sergei Bosiakov, Sergei Rogosin	5287011
Time-Dependent Mesodiffusion through a Boundary: The Current Inversion Phenomenon	V. V. Uchaikin, R. T. Sibatov	5292003

EUROPMENT CONFERENCES: Wednesday September 24th 2014

CONFERENCE ROOM 235': 13:00-15:00

EEMAS Session: Advances in Materials Science

Chair: Nikolay Korovkin, Liudmila Sakhno

Influence of Process Parameters on the Microstructural and Mechanical Properties of Plasma Sprayed Nanostructured YSZ Coatings	C. Lamuta, G. Di Girolamo, P. Caliandro, L. Pagnotta	5225003
Electromagnetic Forces and Field Distribution under Impulse Magnetic Field Impact on Solids of Revolution Made from Hard Ferromagnetic Materials	Egor A. Virva, Vasiliy V. Titkov, Sergey I. Krivosheev, Yuri E. Adamyan	5231015
Capacitance and Impedance Methods of Electric Field Grading in Cable Joint and Termination	George V. Greshnyakov, Simon D. Dubitskiy, Nikolay V. Korovkin	5235011
Different Approaches for Calculation of EMF Induced by the Currents of Overhead Line in the Shields of Buried Cables	Korovkin N. V., Minevich T. G.	5230007
Estimation of Induced EMF Value in Ground Wire During Ice-Melting Procedure	Nikolay Korovkin, Valeriy Goncharov, Nikolay Silin	5230015
Parameters of the Polymerization Process of Error in Determining the Thermochemical Characteristics Insulation	Yuliya V. Koroleva, Evgeniya V. Ivanova, Pavel A. Strizhak	5233003

Coffee Break: 15:00-15:30

CONFERENCE ROOM 118': 15:30-17:30

MMMAS Session: Mathematics and Statistics in Business and Economics

Chair: Galina Silkina, Valeriy Leventsov

Approach to Information Requirements Identification of Procurement Process of Custom Production	Anastasia I. Lyovina, Alissa S. Dubgorn	5225007
Mathematical Modelling as Analytical Instrument of Research of Innovative Processes	Galina Yu. Silkina	5217007
A Simulation Based Decision-Making Support Approach for Foundry Plants Investment Projects Estimation of Efficiency	Mikhail V. Zenkovich, Yury G. Drevs	5234003
Bayesian Probability Models for Critical Illness Insurance	P. Jindrová, V. Pacáková	5222007
Economic and Mathematical Models and Statistical Models of Operational Planning	V. A. Leventsov	5227003
Game-Theoretical Model of Coordination of Interests of State-Private Partnership	Vladimir V. Glukhov, Igor V. Ilin	5218007

EUROPMENT CONFERENCES: Wednesday September 24th 2014**CONFERENCE ROOM 235': 15:30-17:30****MMMAS Session: Computational Techniques for Intelligent Systems****Chair: Alexander Kalimov, Alexander Kolnogorov**

Pole Shape Optimization in Multipole Magnets	A. Kalimov, P. Nalimov	5208003
Finding Minimax Strategy and Minimax Risk for Bernoulli Multi-Armed Bandit	Alexander V. Kolnogorov	5221007
Knowledge Representation in the Category of Unformalized Decision-Making Problems	Lyudmila V. Borisova, Inna N. Nurutdinova, Valery P. Dimitrov	5300003
Some Approaches to Choosing Subcontexts in Good Maximally Redundant Tests Inferring	Xenia Naidenova, Vladimir Parkhomenko	5303011
A Fast Heuristics for Inferring Approximately Minimal Diagnostic Tests	Xenia Naidenova, Vladimir Parkhomenko, Alexander Rudenko	5234011
The Electromagnetics Foundation of Circuits Revisited	Massimo Ceraolo	5276007

EUROPMENT CONFERENCES: Wednesday September 24th 2014

POSTER PRESENTATIONS

Lower Bounds on the Convergence Rate of the Markov Symmetric Random Search	Alexey Tikhomirov	5204007
New Approach for Learning Process Evaluation in Neurodegenerative Diseases Research	Lucie Houdova, Eduard Janecek	5207011
Statistical Linearization Based on the Mutual Quadratic Renyi Information	Kirill R. Chernyshov	5222003
Dynamic State Model of Steam Turbine Hall Equipment Condition for Maintenance Planning and Decision-making Support	Lenka Jirsova, Miroslav Flidr	5223007
Modeling the Unreliability and Condition Evolution of Engine Room Equipment with Respect to Maintenance and Overhaul Effect	Lenka Jirsova, Libor Jelinek	5223011
Determination of the Maximal Installable Potential of Renewable Energy Sources and Their Optimal Deployment in a Geographical Area	Andrea Zapotocka, Martin Strelec, Petr Janecek	5228011
Concentration Transfer for the Problem of Two-Phase Flow of a Fluid and Multicomponent Gas Mixture in Anisotropic Medium	D. O. Dill, A. M. Bubenchikov	5230019
Access Control Model for Grid Calculations	Artem Konoplev, Maxim Kalinin, Dmitry Moskvina, Dmitry Zegzhda	5233015
Top-Level Power Unit System and the Task "Calculation of Technical and Economical Indexes" for the "Kudankulam" NPP	Elena Ph. Jharko	5234007
FPGA Based Omnidirectional Video Acquisition Device (OVAD)	Jan Kwiatkowski, Dawid Sobel, Karol Jedrasiak, Aleksander Nawrat	5235015

EUROPMENT CONFERENCES: Thursday September 25th 2014

CONFERENCE ROOM 118': 09:00-11:00

MMMAS Session: Mathematical Methods in Materials Science and Engineering

Chair: Alla Lebedeva, Margarita Borisova

Multiport Thevenen and Northon Theorems Analog for ARC-Circuits with Nonlinear and Parametric R-Elements	Anatoliy V. Bondarenko, Alla A. Lebedeva, Nikolay V. Korovkin	5231003
Analysis of Non-Stationary Transport of Electrical Charge in Polymer and Composite Materials	M. E. Borisova	5235023
<i>Modeling Silicon Spintronics</i>	<i>Viktor Sverdlov, Joydeep Ghosh, Dmitri Osintsev, Siegfried Selberherr</i>	5295007
Analysis of Processes in DC Arc Plasma Torches for Spraying that Use Air as Plasma Forming Gas	Vladimir Ya. Frolov, Dmitry V. Ivanov	5233007
About Detection Substitutions in Nonlinear Algebraic Equations with Help of Tarjan's Algorithm	A. A. Isakov, Yu. B. Senichenkov	5224011

CONFERENCE ROOM 235': 09:00-11:00

CSSP Session: Linear and Non-Linear Systems

Chair: Bernhard Lampe, Nubia Ilia Ponce De León Puig

Causal Polynomial Pole Assignment for Linear Control Systems	Bernhard P. Lampe, Efim N. Rosenwasser	5176035
Dynamic Optimization of Carbon Dioxide Enrichment for Tomato Crop in a Greenhouse	J. E. Moises Gutierrez, N. Ilia Ponce de Leon Puig, J. Eladio Flores, Ma. Monserrat Morin Castillo, Josefina Castaneda Camacho, Jose Italo Cortes, Pedro Garcia Juarez	5238003
Minimization of THD Using Evolutionary Optimization Methods for Photovoltaic Generation Systems	Jorge Luis Diaz Rodriguez, Luis David Pabon, Aldo Pardo Garcia	5231023
In-circuit Emulation of Memory Fault Injection	Olga V. Mamoutova, Oleg V. Nenashev, Alexey S. Filippov	5294007
Experimental Study of Influence of Orthogonal Magnetization on a Ferromagnetic Characteristic	Yu. E. Adamian, S. I. Krivosheev	5232015
Tropical Cryptography and Analysis of Implementation of New Matrix One-Way Function	Richard P. Megrelishvili	5206011

Coffee Break: 11:00-11:30

EUROPMENT CONFERENCES: Thursday September 25th 2014

CONFERENCE ROOM 118': 11:30-13:30

MMMAS Session: Systems and Automatic Control

Chair: Yury Shornikov, Margarita Borisova

Dynamic Model of the Inverted Pendulum on a Mobile Base with Two Active Wheels and Desing of an Control Law	J. E. Moisés Gutiérrez , J. Gabriel Escamilla, J. Eladio Flores, M. Montserrat Morin, Josefina Castaneda	5238007
The Effect of the Variation of Popov's Parameter on the Size of the Region of Absolute Robust Stability of a Monotonous Nonlinear Impulsive Control System	N. A. Tseligorov, G. M. Mafura	5282003
Mathematical Simulation of Thermal Contact of the Thermocouple for Research of an Error of Measurements	Olga S. Yashutina, Yuliana K. Atroshenko, Pavel A. Strizhak	5220003
Methods of Assessing and Predicting the Energy Efficiency of Electrical Complexes of Urban Distributive Power Grids	V. Frolov, A. Korotkov	5246003
<i>Specification and Analysis of Hybrid Systems with PDE in ISMA Simulation Environment</i>	<i>Yu. V. Shornikov, A. V. Bessonov, M. S. Myssak, D. N. Dostovalov</i>	<i>5223003</i>

EUROPMENT CONFERENCES: Thursday September 25th 2014

POSTER PRESENTATIONS

Improved Hydrolysis of Pretreated Lignocellulosic Biomass using Mobile Enzyme Sequestration Platforms	Ruben Michael Ceballos, Ruben Michael Ceballos Jr., Asha Rani, Chelsea Teresa Morales, Natalia Alekseyevna Batchenkova	5250003
Implementation of ECDH through Software Code Scheduling with Minimum Number of Point Computations	Sakthivel Arumugam	5266003
Thermochemical Non-Equilibrium Reentry Flows in Three-Dimensions: Seven Species Model – Part I – Structured Solutions	Edisson S. G. Maciel, Amilcar P. Pimenta, Nikos E. Mastorakis	5286015
Management of a Standardized Platform of Unified Medical History from Health Interoperability - Case Study Colombian Caribbean Islands System	Fernando Prieto Bustamante, Yaneth P. Caviativa, Yoan Manuel Guzman	5295015
Effect of Attack and Cone Angels on Air Flow Characteristics for Staggered Wing Shaped Tubes Bundle	Sayed Ahmed E. Sayed, Emad Z. Ibrahim, Osama M. Mesalhy, Mohamed A. Abdelatief	5298003
Adjustment Semantics of Real Time Constructions in UCM Language for Implementation in Translator of UCM to Basic Protocols	V. Kotlyarov, P. Drobintsev, I. Nikiforov	5299003
High Performance Concrete Using Blast Furnace Slag as Coarse Aggregate	V. P. Singh	5308011
Demand Response in Residential AC Load Using Rescheduling Strategy	Monika Arora, Saurabh Chanana	5308015
Computer Modelling of Hydropower-Driven Systems with Thermal and Electric Energy Sources	A. I. Ozersky	5309003
New Approach to the Power Network Protection against Ultrawide Band Pulses	Alexander T. Gazizov, Alexander M. Zabolotsky	5314007
Comparative Fuel Economy and Environmental Analysis of Conventional Hybrid and Plug-In Hybrid Vehicles	Morteza Montazeri-Gahjavarestani, Mehdi Mahmoodi-Kaleybar, Vahid Madanipour	5316003

