



SUMMA2019



1st International Conference on Control Systems, Mathematical Modeling, Automation and Energy Efficiency

SUMMA2019 CONFERENCE PROGRAM

Venue: Russia, Lipetsk, Moskovskaya str., 30
Lipetsk State Technical University

November, 20-22



LIPETSK STATE
TECHNICAL UNIVERSITY



SUMMA2019 CONFERENCE

The 1st International Conference on Control Systems, Mathematical Modeling, Automation and Energy Efficiency SUMMA2019 is devoted to very special events. This year departments of our faculty (Faculty of Automation and Computer Science) celebrate anniversaries: the Department of Electric Drive is 45, the Department of Informatics is 40, the Department of Applied Mathematics is 25 and the Department of Electrical Equipment is 25. We will be happy to share our latest scientific and applied progress with our dear guests during the Conference.

We hope, that the Conference will become a traditional place to discuss special issues of Control Systems and Mathematical Modeling, Automation and using advanced knowledge in the Power Industry to solve scientific and practical production problems.

SUMMA2019 TOPICS

Scientific program includes topics of interest that consist of, but are not limited to:

I. Industrial Applied Mathematics and Modeling

Mathematical Foundations of Control Theory; Control of Organizational and Socio-Economic Systems; Machine Learning

II. Automation

Industrial Automation and Control Theory applying to Technological Processes; Digitalization in Industrial, Economic and Social Systems; Metals and Mining Industry; Transportation Systems

III. Industrial and Commercial Power and Power Conversion Systems

Energy Systems and Power Systems Engineering: Electric Machines and Industrial Drives; Power Electronic Devices and Components

HONORARY CO-CHAIRS

Stanimir VALTCHEV (Portugal)

Tamas RUZSANYI (Hungary)

Yousef IBRAHIM (Australia)

Juan J. RODRIGUEZ-ANDINA (Spain)

Ersan KABALCI (Turkey)

Kouhei OHNISHI (Japan)

Valeriy VYATKIN (Sweden)

Dmitry NOVIKOV (Russia)

GENERAL CO-CHAIRS

Pavel SARAEV (Russia)

Dmitry NOVIKOV (Russia)

Stanimir VALTCHEV (Portugal)

TECHNICAL PROGRAM CO-CHAIRS

Anatoly POGODAEV (Russia)

Olja ČOKORILO (Serbia)

Maria Cristina RECCHIONI (Italy)

Vladimir ALEKSEEV (Russia)

Sergey BARKALOV (Russia)

Semen BLYUMIN (Russia)

Vladimir BURKOV (Russia)

Alexander VORONIN (Russia)

Mikhail GITMAN (Russia)

Yuri GROMOV (Russia)

Mikhail GOUBKO (Russia)

Aleksey DAGMAN (Russia)

Yuri EREMENKO (Russia)

Tamara KISELEVA (Russia)

Yuri KUDINOV (Russia)

Tatiana LEDENEVA (Russia)

Alexander LOSEV (Russia)

Viktor MESHERYAKOV (Russia)

Maria ORESHINA (Russia)

Fedor PASHENKO (Russia)

Vladimir PIMENOV (Russia)

Semen PODVALNY (Russia)

Valery STOLBOV (Russia)

Yuri TALAGAEV (Russia)

Tamara CHISTYAKOVA (Russia)

Alexander SHASHKIN (Russia)

Alexander SHPIGANOVICH (Russia)

LOCAL ORGANIZING COMMITTEE

Alexander GALKIN

Anton SYSOEV

Roman BATISHEV

Oleg NAZARKIN

Evgeny ZATSEPIN

Elena KHABIBULLINA

Aleksey EVSEEV

Wednesday, November, 20th, 2019

09:00 – 10:00	Registration of the conference participants
10:00 – 10:30	Opening Ceremony
10:30 – 12:30	Plenary Session <i>Pavel SARAEV, D.Sc., Prof.</i> <i>Russia, Lipetsk, Lipetsk State Technical University</i> Mathematical Remodeling
	<i>Stanimir VALTCHEV, Prof.</i> <i>Portugal, Lisboa, Universidade Nova de Lisboa</i> Is the DC Grid and the HF Wireless Power Transmission a Way Out of the AC Grid Problems?
	<i>Mikhail GOUBKO, D.Sc., Prof.</i> <i>Russia, Moscow, V.A. Trapeznikov Institute of Control Sciences RAS</i> Perspectives of control theory in smart grids: artificial intelligence, optimization, and human behavior
12:30 – 12:40	General photo of the conference participants
12:30 – 13:00	Coffee Break
13:00 – 14:30	Section Sessions
14:30 – 15:30	Lunch Time (lunch paid by participants on their own)
15:30 – 18:30	Section Sessions
19:00	Gala Dinner

Thursday, November, 21st, 2019

10:00 – 12:00	Plenary Session <i>Kouhei OHNISHI, Prof.</i> <i>Japan, Keio University, Haptics Research Center</i> Haptics for Automation and Medicine
	<i>Juan J. RODRIGUEZ-ANDINA, Prof.</i> <i>Spain, Vigo, University of Vigo</i> Wearable Devices, Embedded Systems, and Artificial Intelligence for Aging Patient Empowerment
	<i>Tamara CHISTYAKOVA, D.Sc., Prof.</i> <i>Russia, Saint Petersburg, Saint Petersburg State Institute of Technology</i> Modern Digitalization Problems of Industrial Systems Taking into Account Waste Recycling
13:00 – 18:00	Visit to Novolipetsk Steel Corporation (the largest Russian steel company)
13:00 – 14:30	Section Sessions
14:30 – 15:00	Coffee Break
15:00 – 18:30	Section Sessions

Friday, 22nd, 2019

10:00 – 12:00	Plenary Session
	<i>Viktor MESHERYAKOV, D.Sc., Prof.</i> <i>Russia, Lipetsk, Lipetsk State Technical University</i> Energy-saving Transport Electric Drive Systems
	<i>Aleksey DAGMAN, Cand.Sc</i> <i>Russia, Lipetsk, Novolipetsk Steel Corporation</i> <i>Denis KOVALEV</i> <i>Russia, Lipetsk, Novolipetsk Steel Corporation</i> <i>Vladimer PIMENOV, Cand. Sc., Senior Scientist</i> <i>Russia, Lipetsk, Novolipetsk Steel Corporation</i> <i>Anatoly POGODAEV, D.Sc., Prof.</i> <i>Russia, Lipetsk, Lipetsk State Technical University</i> Application of Mathematical Modeling Methods in Solving Problems of Improving the Quality of Rolled Products
	<i>Acronis</i> Cybersecurity and Data Protection
12:00 – 13:30	IEEE Round Table
13:30 – 14:00	Closing Ceremony

DETAILED PROGRAM

Wednesday, November, 20th, 2019

10:00 – 10:30	Opening Ceremony	Academic Council Hall
10:30 – 12:30	Plenary Session	
	<i>Pavel SARAEV, D.Sc., Associate Prof.</i> <i>Russia, Lipetsk, Lipetsk State Technical University</i> Mathematical Remodeling	
	<i>Stanimir VALTCHEV, Prof.</i> <i>Portugal, Lisboa, Universidade Nova de Lisboa</i> Is the DC Grid and the HF Wireless Power Transmission a Way Out of the AC Grid Problems?	
	<i>Mikhail GOUBKO, D.Sc., Prof.</i> <i>Russia, Moscow, V.A. Trapeznikov Institute of Control Sciences RAS</i> Perspectives of control theory in smart grids: artificial intelligence, optimization, and human behavior	
12:30 – 12:40	General photo of the conference participants	
12:30 – 13:00	Coffee Break	
13:00 – 14:30	Section Sessions	
14:30 – 15:30	Lunch Time (lunch paid by participants on their own)	
15:30 – 18:30	Section Sessions	
19:00	Gala Dinner	

SECTION SESSIONS

Session 1 Industrial Applied Mathematics and Modeling – Mathematical Foundations of Control Theory (13:00–14:30)	Chairman Semen Blyumin Hall Academic Council Hall	ArtID
On the Notion of Neighborhood System <i>Nikolai Mishachev and Anatoly Shmyrin</i>		12
Model of Optimization of Arrangement of Video Surveillance Means with Regard to Ensuring Their Own Security <i>Valerii Menshikh, Dmitrii Kalkov and Natalia Spiridonova</i>		33
On the Control Problems of a Two-Link Robot Manipulator <i>Aleksandr Andreev and Katherine Sutyorkina</i>		119
Synthesis of the Base Models for Analysis of Finite Fluctuations Based on Filtering Algorithms <i>Natalya Zhanova and Sergey Zhanov</i>		185
Stability of Periodic Movements In Sampled Data Relay Feedback Control Systems <i>Sergey Feofilov and Andrew Kozyr</i>		90

Session 2 Industrial Applied Mathematics and Modeling – Mathematical Foundations of Control Theory (15:30–18:30)	Chairman Tatiana Ledeneva Hall Academic Council Hall	ArtID
A Numerical Method for Constructing Attractors of Evolution Equations of Filtration <i>Anton Salnikov, Atlas Akhmetzianov, Alexei Kushner and Valentin Lychagin</i>		121
Designing the Four-Tooth-Shaped Microstrip Antenna for Wi-Fi Applications <i>Angelina Markina and Dmitrii Tumakov</i>		72
Neural Network Algorithms to Control Dynamic Objects <i>Vladimir Alekseev, Aleksey Eliseev, Konstantin Kolegov and Fatima Aminova</i>		188
Mathematical Modeling and Optimization of Chemical and Technological Processes <i>Semen Spivak and Olga Kantor</i>		68
The Model and Algorithm for Ensuring the Survivability of Control Systems of Dynamic Objects in Conditions of Uncertainty <i>Dmitry Polyakov, Aleksey Eliseev, Maria Moiseeva, Vladimir Alekseev and Konstantin Kolegov</i>		187
On One Class of Generalized Operations for the Representation and Interpretation of Triangular Norms and Conorms <i>Tatiana Ledeneva</i>		95
Mathematical and Computer Modeling of a New Type of Two-Link Manipulator <i>Aleksandr Krasinskiy and Andrey Yuldashev</i>		69
Options for Identification and Mixed Control of Neighborhood Systems <i>Alexey Yartsev, Anatoly Shmyrin and Evgeny Podvalny</i>		133
Modeling Information Security Infringements in Mobile Self-Organizing Network of Communication Using Fuzzy Logic and Theory of Graphs <i>Nikolay Khokhlov, Sergey Kanavin and Andrey Rybokitov</i>		58
Fuzzy Remodeling and Synthesis of the Class of Nonlinear Systems Based on the Invariant Ellipsoid Technique <i>Yuri Talagaev</i>		49
Mathematical Apparatus For The Construction Of Homodesmic Reactions <i>Albina Akhmetyanova, Fairuza Ziganshina and Albina Ismagilova</i>		124

Session 3 Industrial Applied Mathematics and Modeling – Control of Organizational and Socio-Economic Systems (13:00–14:30)	Chairman Sergey Listopad Hall 219	ArtID
Optimal Control for the Hierarchic Structure of the Company's Production Subsystem <i>Mikhail Kharitonov, Alexander Voronin and Tatyana Kharitonova</i>		122
Dynamic Model of Macregion Subjects` Interests Coordination <i>Tatiana Anopchenko, Olga Gorbaneva, Elena Lazareva, Anton Murzin, Gennady Ougolnitsky and Evgeniya Roshchina</i>		34
Analysis of the Heat Tariff Impact on Gross Regional Product in the Samara Region <i>Artem Doronin and Konstantin Trubitsyn</i>		147
Models of Centralized Equipment Procurement Based on Supplier-consumer Matching <i>Mikhail Matveev and Semen Podvalny</i>		76
Models to Control Volga HES Discharge in Spring <i>Mikhail Kharitonov, Alexander Voronin and Inessa Isaeva</i>		82
Distribution Grid Restoration Planning using Methods of Hybrid Intelligent Multi-agent Systems of Heterogeneous Thinking <i>Sergey Listopad</i>		41

Session 4 Industrial Applied Mathematics and Modeling – Control of Organizational and Socio-Economic Systems (15:30–17:30)	Chairman Vsevolod Korepanov Hall 219	ArtID
Peculiarities of Firefighting and Technical Equipment Choice for the Elimination of Transport Emergencies <i>Andrew Kalach, Denis Sotnikov, Alexandr Zenin, Artem Akulov, Ivan Saraev and Elena Kalach</i>		16
Modelling and Analysing the Dynamic Interaction between Competing Branches of the Regional Economy as a Multiagent Control System <i>Semen Podvalny, Natalia Minakova and Eugeny Vasiljev</i>		37
Economical and Social Estimates of Development of Fuel and Energy Holding <i>Vladislav Gusev and Natalya Isaeva</i>		26
Sociophysical Approach to Modeling Innovative Projects <i>Irek Mustaev, Evgeniy Semivelitchenko, Vladimir Ivanov, Natalia Maksimova and Timur Mustaev</i>		149
Strategic Thinking Models for Team Building <i>Vsevolod Korepanov</i>		156
Information control in reflexive games with agents preliminary informational interactions <i>Denis Fedyanin</i>		114
Risk Assessment in Human Resource Management Using Predictive Staff Turnover Analysis <i>Timofey Tarusov and Olga Mitrofanova</i>		106

Session 5 Automation – Industrial Automation and Control Theory applying to Technological Processes (13:00–14:30)	Chairman Atanas Nachev Hall L1	ArtID
Development of an Automatic System of Stabilization Thrust Force at the Turning Operations and Its Mathematical Model <i>Ishembek Kadyrov and Baktybek Turusbekov</i>		74
Improving Automation Process Control Systems and Advantages of the New Fuzzy Logic Approach to Object Real-time Control as a Part of Artificial Intelligence Feature Used in Oil and Gas Production, Transportation and Treatment Systems <i>Artur Sagdatullin</i>		170
Development of a Biological Wastewater Treatment Control System for the Sustainable Development of the Regional Economy <i>Nikolay Popov, Olga Peshcherova and Lyudmila Chuksina</i>		145
Analytical Method for Calculating the Ratio Signal Atmospheric Radio Noise for Digital VLF Radio Devices Using a Generalized Empirical Model <i>Vladimir Osinin, Tatiana Gerasimenko, Svetlana Komolikova, Elena Uglova and Artem Osinin</i>		158
Software for Modeling the Temperature Distribution of Strip and Work Rolls During Hot Rolling <i>Maria Oreshina, Vladimir Pimenov and Monika Dabas</i>		189
An Approach for Determining the Location of an Object Detected by a Sensor <i>Nikolay Gueorguiev, Atanas Nachev and Vladimir Varbanov</i>		28

Session 6 Automation – Industrial Automation and Control Theory applying to Technological Processes (15:30–18:00)	Chairman Anton Glushchenko Hall L1	ArtID
Computer – Aided Design of Cefotaxime-imprinted Polymer <i>Nadezhda Karaseva, Vladislav Gvozdkov, Nikolay Baryshev and Andrew Dudkin</i>		169
Control of a Complex of Works in Multiprocessor Real-time ACS <i>Dmitry Kononov and Meran Furugyan</i>		54
Fuzzy Quadratic Control of Thermal Object <i>Fedor Pashchenko, Alexander Pashchenko, Yuri Kudinov and Eugene Duvanov</i>		79
Automation of the Technological Process of Cleaning Tubing During the Repair of Downhole Equipment Using a Mobile Robotic Complex <i>Rustem Munasypov, Timur Mustaev and Marsel Sharipov</i>		148
Study of the Stress-strain State (SSS) and the Type of Stress state of a Model Closed Wing of an Airplane by the Using Speckle Interferometry <i>Nay Min Htet and Igor Volkov</i>		154
Information Processes and the Reliability Characteristics of the Means for Their Realization <i>Atanas Nachev, Nikolay Gueorguiev and Ognyan Todorov</i>		27
Applying the Nonparametric Approach to Build Process Control Charts <i>Marina Zhuravlyova</i>		178
Inverse Problems of Chemical Kinetics on Volpert's Graph <i>Zulfiya Khamidullina, Al'bina Ismagilova and Semen Spivak</i>		66
Application of Fuzzy Logic to Develop Predictive Controller <i>Andrey Fomin and Anton Glushchenko</i>		32
Neural Network Speed Observers <i>Tatyana Sinyukova, Evgeny Sentsov and Alexey Sinyukov</i>		84

Session 7 Automation – Digitalization in Industrial, Economic and Social Systems (13:00–14:30)	Chairman Hall	Oleg Maryasin 9-402	ArtID
Experiences Creating an Automated Information System for Gathering and Analyzing the Results of Activities of Researchers and Scientific Groups <i>Anton Salnikov, Alexey Batov, Ivan Boronin and Ivan Barabanov</i>			135
Intelligent Multi-Agent Building Management in Various Operation Modes <i>Oleg Maryasin</i>			15
Digitalization of the University – What is It? <i>Inna Muzyleva, Liubov Yazykova and Viktor Penkov</i>			115
Determination of Information System Structure Parameters in Conditions of Uncertainty <i>Yuri Gromov, Yuri Minin, Sergey Kopylov, Ali Abdulkarem Habib Alrammahi and Farah Abbac Sari</i>			138
Multi-Agent Architecture for Medical Diagnostic Systems <i>Tatyana Buldakova, Anna Lantsberg and Sergey Suyatinov</i>			56
Implementation of the Concept of "Smart Laboratory" in the Framework of Digitization of the University <i>Inna Muzyleva, Denis Shishlin, Liubov Iazykova, Pavel Dobrynin and Sergey Ambrosimov</i>			120

Session 8 Automation – Digitalization in Industrial, Economic and Social Systems (15:30–18:30)	Chairman Hall	Yuri Gromov 9-402	ArtID
Probabilistic and Fuzzy Models of the Optimal Allocation of Resources of a Network Information System <i>Yuri Gromov, Yuri Minin, Ali Abdulkarem Habib Alrammahi and Farah Abbac Sari</i>			132
Combined Approach to Detect Anomalies in Health Care Datasets <i>Anton Sysoev and Roman Scheglevatykh</i>			181
The Architecture of the Cloud Service for Loyalty Program Mobile Application in the Context of the Fuel Station Networks <i>Sergey Mikheev and Alexandr Pylkin</i>			144
Digital Reality as an Environment for the Professional Growth of Youth <i>Tatiana Bolshunova and Maxim Zimin</i>			175
Identification of the Structural Transformations of Time Series Using Fuzzy Clustering Algorithms <i>Stepanov Maksim</i>			24
Overall Score of Information System Performance and Selection of Synthesis Problem <i>Yuri Gromov, Yuri Minin, Aleksey Eliseev, Ali Abdulkarem Habib Alrammahi and Farah Abbac Sari</i>			128
Structuring of the Visual Diagnosis World <i>Sophiya Rumovskaya</i>			107
Network Services for Interaction of the Telemedicine System Users <i>Tatyana Buldakova and Aksinya Sokolova</i>			14
Implementation of Aggregate Functions for Interval-valued Java Data Type in the Oracle DBMS <i>Pavel Domashnev and Vladimir Alexeev</i>			168
Creation of Management Systems for Business Processes of an Industrial Enterprise Using Ontologies <i>Valentina Goryunova and Tatyana Goryunova</i>			162

Session 8 Automation – Digitalization in Industrial, Economic and Social Systems (15:30–18:30)	Chairman Hall Yuri Gromov 9-402	ArtID
Synthesis of the Information System Structure in Conditions of Uncertainty <i>Yuri Gromov, Yuri Minin, Sergey Kopylov, Ali Abdulkarem Habib Alrammahi and Farah Abbac Sari</i>		137
Modeling the Destructive Effect of Interference on Mobile Networks, Using the 3G Standard as an Example, Using a Noise Generator <i>Igor Gilev and Kanavin Sergey</i>		59
Intensive Data Collection System for Smart Grid and Smart Building Research <i>Nikolay I. Bazenkov, Boris A. Boldyshev, Sergey V. Dushin, Sergey A. Frolov, Mikhail V. Goubko, Vsevolod O. Korepanov, Leonid A. Sereda</i>		191

Session 9 Industrial and Commercial Power and Power Conversion Systems – Electric Machines and Industrial Drives (13:00–14:30)	Chairman Hall Yuri Shurygin L2	ArtID
Evaluation and Analysis of Load Graph Parameters in operation of Electric Arc Furnaces in Group <i>Yuri Shurygin</i>		172
The Charging Strategy Selection for Variable-Frequency Electric Drive with Supercapacitors <i>Vladimir Polyakov, Iurii Plotnikov and Nikita Postnikov</i>		150
Thermal model of a linear electric machine <i>Alfred Safin, Andrei Kopylov, Ramil Gibadullin, Timur Petrov, Rustem Khusnutdinov and Oleg Fedorov</i>		8
Modernization of the scheme and creation of a program for the analysis of the cycle of a combined cycle gas turbine on blast-furnace gas <i>Andrey Kirin and Vasily Gubarev</i>		157
Methods for reducing electromechanical oscillations in conveyor control systems <i>Tatyana Sinyukova, Vladislav Gladyshev and Alexey Sinyukov</i>		123
Method of Sensorless Determination of Mechanical Parameters and Information-Measuring System of Valve-Inductor Drives <i>Pavel Levin, Vadim Blazhevich, Andrei Boikov and Victor Penkov</i>		116

Session 10 Industrial and Commercial Power and Power Conversion Systems – Electric Machines and Industrial Drives – Power Electronic Devices and Components (15:30–18:30)	Chairman Hall Stanimir Valchev L2	ArtID
Development of a Control Algorithm for Three-phase Inverter in Two-phase Electric Drives Reducing the Number of Commutations <i>Aleksei Belousov, Viktor Meshcheryakov, Stanimir Valtchev and Oleg Kryukov</i>		92
PI-controller Fuzzy Tuner Based on Transient Quality Estimation to Control DC Drive Speed <i>Vladislav Petrov, Maksim Serov and Anton Glushchenko</i>		91
Development of a Start-up Model of a Submersible Electric Motor when the Electric Centrifugal Pump is Installed and Set to Operating Mode <i>Artur Sagdatullin</i>		174
Energy-efficient Half-bridge Voltage Converter for Vehicle Electrical Systems <i>Pavel Tatuyko, Galina Fedyayeva, Vladimir Kobishanov and Vladimir Fedorov</i>		87

Session 10 Industrial and Commercial Power and Power Conversion Systems – Electric Machines and Industrial Drives – Power Electronic Devices and Components (15:30–18:30)	Chairman Stanimir Valchev Hall L2	ArtID
Analysis of Radiated EMI from ESD <i>Maksim Tomilin</i>		52
Electric Field Mathematical Modelling at Probe Measurement in Anisotropic Semiconductor Films <i>Vladimir Filippov, Sergey Mitsuk and Sergey Luzyanin</i>		130
Safe Working Space of the Hot-line Working Robot in 110kV substation <i>Mingdong Tang, Youlin Gu and Shigang Wang</i>		5
Connection Options for Compact Structures in Miniaturization of a Directional Coupler <i>Hung Luu Quang</i>		100
Mathematical Modeling of Photonic Crystal Resonators Based on the Lasing Eigenvalue Problem <i>Anna Repina and Alina Oktyabrskaya</i>		29
Research of IGBTs Thermal Modes in Power Converters <i>Maxim Bobrov, Gennady Tutaev, Yuriy Fedotov, Nikita Dubov and Vladislav Artamonov</i>		143
Description of a Miniaturization Tool for a Directional Coupler on a Microwave Substrate <i>Hung Luu Quang</i>		101
Circuit Schematics of a Capacitive Proximity Sensor <i>Nikita Pavliuk, Ekaterina Cherskikh, Nikolai Pshchelko and Alexandra Shabanova</i>		25

Thursday, November, 21st, 2019

10:00 – 12:00	Plenary Session <i>Kouhei OHNISHI, Prof.</i> <i>Japan, Keio University, Haptics Research Center</i> Haptics for Automation and Medicine	Academic Council Hall	
	<i>Juan J. RODRIGUEZ-ANDINA, Prof.</i> <i>Spain, Vigo, University of Vigo</i> Wearable Devices, Embedded Systems, and Artificial Intelligence for Aging Patient Empowerment		
	<i>Tamara CHISTYAKOVA, D.Sc., Prof.</i> <i>Russia, Saint Petersburg, Saint Petersburg State Institute of Technology</i> Modern Digitalization Problems of Industrial Systems Taking into Account Waste Recycling		
TRACK 1		TRACK 2	
13:00 – 18:00	Visit to Novolipetsk Steel Corporation (the largest Russian steel company)	13:00 – 14:30	Section Sessions
		14:30 – 15:00	Coffee Break
		15:00 – 18:30	Section Sessions

SECTION SESSIONS

Session 11 Industrial Applied Mathematics and Modeling – Mathematical Foundations of Control Theory (13:00–14:30)	Chairman Fatimat Kudayeva Hall Academic Council Hall	ArtID
Synthesis of an Algorithm for Angle Measurement Channel of The Information-Measuring System of a Maneuvering Aircraft Given Its Dynamic and Kinematic Characteristics <i>Anatoly Pudovkin, Yuri Panasyuk and Stanislav Danilov</i>		109
Mathematical Modeling of the Security Management Process of an Information System in Conditions of Unauthorized External Influences <i>Nikita Goncharov, Alexander Dushkin and Igor Goncharov</i>		22
The Method of Boundary States in Solving Problems of Thermoelasticity in the Presence of Mass Forces <i>Dmitriy Ivanychev</i>		94
Mathematical Model for Managing the Dynamics of the Development of Information Conflict in Information Systems <i>Artem Noev, Alexander Dushkin and Victor Sumin</i>		21
Calculation of Industrial Membrane Processes Based on Mathematical Modeling <i>Vladimir Bogomolov, Sergey Lazarev and Oleg Abanosimov</i>		86
Information Technologies in The Study of the Problem With Free Boundaries of the Controlled Cryodestruction of Biological Tissue <i>Fatimat Kudayeva, Arslan Kaygermazov, Diana Khashkhozheva, Aslan Zhemukhov, Svetlana Balkarova and Madina Etezova</i>		19

Session 12 Industrial Applied Mathematics and Modeling – Mathematical Foundations of Control Theory (15:00–17:00)	Chairman Semen Spivak Hall Academic Council Hall	ArtID
Accounting of Loops in Matrices of Graphs <i>Semen Blyumin and Svetlana Tkachenko</i>		155
Maximum Permissible Estimates in the Problems of Quantitative Analysis of Multicomponent Mixtures <i>Olga Kantor and Semen Spivak</i>		67
Mathematical Analysis of the Maltus Population Model in a Variable Environment <i>Fatimat Kudayeva, Arslan Kaygermazov, Diana Khashkhozheva, Aslan Zhemukhov, Svetlana Balkarova and Madina Etezova</i>		20
Output Transients in Linear SISO Systems <i>Nikita Bersenev and Victor Utkin</i>		55
On Output Feedback Control Problems of an Industrial Robot Manipulator <i>Aleksandr Andreev, Olga Peregodova, Lubov Takhtenkova and Lubov Kolegova</i>		71
Reduction of Steganalytical Methods Set with Determined Reliability <i>Roman Solodukha and Igor Atlasov</i>		98
Modeling and calculation of probabilities of states of a system of elements with two states <i>Oleg Boldyrikhin</i>		177

Session 13 Industrial Applied Mathematics and Modeling – Control of Organizational and Socio-Economic Systems (13:00–14:30)	Chairman Semen Blyumin Hall L3	ArtID
Bonnet formulas and the second mean value theorem in studying of socio-economic systems <i>Galina Borovkova and Semen Blyumin</i>		163
Research of the Model of Territorial Distribution of Labor Resources <i>Irina Zaitseva, Oleg Malafeyev, Anna Ermakova, Stanislav Dronov, Nikita Ugegov and Galina Pupysheva</i>		50
Game-theoretic model of the optimal distribution of labor resources <i>Irina Zaitseva, Oleg Malafeyev, Sergey Sychev, Gennady Badin, Diana Kurasova and Tatyana Gurnovich</i>		62
Competitive spatial pricing model <i>Oleg Malafeyev, Anna Romanova, Irina Zaitseva, Afanasy Zubov, Andrei Murashko and Leonid Kolyada</i>		48
Describing the Structures of Socio-economic Systems Using Metagraphs <i>Artem Miroshnikov and Natalya Zhbanova</i>		184
Complex of Description Models for Analysis and Control Group Behavior Based on Stochastic Cellular Automata with Memory and Systems of Differential Kinetic Equations <i>Anna Smychkova and Dmitry Zhukov</i>		30

Session 14 Industrial Applied Mathematics and Modeling – Control of Organizational and Socio-Economic Systems (15:00–16:30)	Chairman Maxim Novak Hall L3	ArtID
Application of the Method of Moving Ages to Predict the Population of the Lipetsk Region <i>Maxim Novak and Elena Kozlova</i>		190
Game-theoretic Model of the Dynamic Problem of Labor Resources Optimal Assignment <i>Irina Zaitseva, Oleg Malafeyev, Nataliya Poddubnaya, Vyacheslav Orlov, Lidiya Bondarenko and Valentina Petrova</i>		53
An Inverse Problem Solution in Semiotic Systems Under Uncertainty <i>Alexander Kulinich</i>		102
Time Series and Its Characteristics Variability Analysis Using the Forecasting Model Based on the Basis of Interval Discrete Fuzzy Sets of the Second Type <i>Stepanov Maksim and Liliya Demidova</i>		23
Enterprise Management Mobile Assistant based on Using the Theory of Fuzzy Logic and Fuzzy Sets <i>Valeriia Tishkina, Alexandr Pylkin, Alexandr Kroshilin, Svetlana Kroshilina and Alexei Evseev</i>		129
Decision Support for Project Risk Management Using the Information-Semantic Field <i>Anna Guseva, Matvey Koptelov and Dmitriy Kovtun</i>		112

Session 15 Industrial Applied Mathematics and Modeling – Machine Learning (13:00–14:30)	Chairman Hall	Olga Ivanova 9-402	ArtID
Improving Quality of the Multiclass SVM Classification Based on the Feature Engineering <i>Irina Klyueva</i>			81
A Robust algorithm for Detecting Shilling Attacks on Recommendation Systems <i>Eugene Shchetinin</i>			80
Fuzzy Data Analysis for the Optimal Choice of Polymer Systems <i>Ilya Germashev, Tatyana Mashihina and Evgeniya Derbisher</i>			159
Evaluation of Adverse Factors Acting on a Pre-stressed Wire Rope Structure by means of Artificial Neural Network <i>Andrei Chesnokov, Vitalii Mikhailov and Ivan Dolmatov</i>			118
Application of Machine Learning Methods for Classification of Telemetric Frames by Compression Algorithms <i>Alexey Levenets, Ilya Bogachev and En Un Chye</i>			31
Applying the Autonomous Anthology Compilation Algorithm Using the Inductive Reasoning Method <i>Igor Zemtsov and Olga Ivanova</i>			111
Computer System of Paralinguistic Analysis Based on Recurrent Neural Nets <i>Eugene Shchetinin</i>			78

Session 16 Industrial Applied Mathematics and Modeling – Machine Learning (15:00–18:30)	Chairman Hall	Alexis Kwasinski 9-402	ArtID
The Optimal Time Typing to Identifying Users at the Keyboard Handwriting <i>Iurii Ivanovich Eremenko, Iuliia Sergeevna Oliunina</i>			44
Defining the Ranges Boundaries of the Optimal Parameters Values for the Random Forest Classifier <i>Maria Ivkina and Liliya Demidova</i>			51
Computer System of Industrial Data Mining for Resource-Saving Control of Steel-Smelting Converter Production <i>Tamara Chistyakova, Inna Novozhilova and Vladimir Kozlov</i>			13
Natural Language Voice Control Interface for People With Special Needs and Disabilities <i>Sergey Kirillov, Oleg Shustikov and Vladimir Dmitriev</i>			136
Models and Data Mining Algorithms for Solving Classification Problems <i>Zayar Aung, Mikhaylov Ilya Sergeevitch and Ye Thu Aung</i>			152
Approaches to Construct a Psychological Portrait of Users Based on Analysis of Data in Open Profiles of Social Networks <i>Evgenia Ishukova, Viacheslav Salmanov, Andrey Kalyabin and Anatoliy Antonenko</i>			73
Application of the Machine Learning Tools in the Problem of Classifying Failures in the Work of the Complex Technical System <i>Liliya Demidova, Maria Ivkina and Dmitriy Marchev</i>			88
Energy Management for Microgrids Using a Hierarchical Game-machine Learning Algorithm <i>Rui Hu and Alexis Kwasinski</i>			103
Efficient SVM-based Approach for CBIR <i>Nikita Vorobzhanskiy</i>			131
Fatigue Recognition based on Audiovisual Content <i>Dmitrii Malov and Olga Shumskaya</i>			70

Session 16 Industrial Applied Mathematics and Modeling – Machine Learning (15:00–18:30)	Chairman Hall	Alexis Kwasinski 9-402	ArtID
Decision Support System for Repair Management at Industrial Enterprises <i>Vitaly Borodin, Oleg Protalinskiy and Igor Protalinskiy</i>			45
Using Algorithms for the Study of Intelligent Interfaces for Solving Pattern Recognition Tasks <i>Igor Zemtsov and Olga Ivanova</i>			110
The Effectiveness Research of Different Methods of a User Identification in the Noisy Channel Case <i>Alexander Pashentsev and Vitalii Vedishchev</i>			167

Session 17 Automation – Metals and Mining Industry (13:00–14:30)	Chairman Hall	Sergey Kuzenkov 219	ArtID
Method of Operational Diagnostics of Metal Cutting Machine Modules <i>Kamil Masalimov, Rustem Munasypov, Sergey Fecak and Yulia Idrisova</i>			105
Computer Simulation of Steel Ingot Cooling in Continuous Steel Casting Unit <i>Alexander Galkin, Pavel Saraev, Dmitry Tyrin and Vladimir Pimenov</i>			183
Analysis of Algorithms for Scheduling Complex Production Systems <i>Olesya Kovrizhnykh and Michael Tsukanov</i>			42
Mathematical Modeling and Planning of a Three-Factor Experiment to Determine the Content of Copper and Zinc in the Brass Coating of Steel Wire <i>Olga Shashkanova and Kristina Maliutina</i>			99
The Concept of Creation of Highly Effective Technology of Multipurpose Anode Processing <i>Sergey Kuzenkov</i>			108

Session 18 Automation – Transportation Systems (15:00–17:30)	Chairman Hall	Dmitry Kadasev 219	ArtID
Data Warehouse Model of Regional Intelligent Transportation System in The Concept of ITS-Russia <i>Elena Khabibullina and Anatoly Pogodaev</i>			186
Synergetic Synthesis of “Flying Platform” Hierarchic Control System <i>Oleg Voronkov</i>			47
New polymeric composition nanomaterial of increased shock strength for restoration of parts of autotractor equipment <i>Olga Kovvryalova, Anton Butin and Mikhail Shipulin</i>			164
Research of the Dependence of Radial Gap on the Tension of the Polimeric Landing “Bearing-Housing” and the Heating Temperature of the Node when Restoring Body Parts Polymeric Materials <i>Kirsanov Filipp, Korostelev Aleksey and Kovvryalova Olga</i>			166
Tribological Parameters of Contact of Loaded Bodies With Raceway Rings in the Test Car Bearings <i>Andrey Bykonya</i>			64
Stand for Research of Contact Stresses and Longevity of Cars Bearing Units <i>Roman Lee, Andrey Pchelnikov and Andrey Bykonya</i>			60

Session 18 Automation – Transportation Systems (15:00–17:30)	Chairman Hall Dmitry Kadasev 219	ArtID
Model of Adaptive Neuro-Fuzzy Scale for Evaluation of Diagnostics Parameters of Heterogeneous Robotic System <i>Vladimir Goncharenko and Andrey Volkov</i>		4
Approach to Sensitivity Analysis of Stochastic Freeway Capacity Model Based on Applying Analysis of Finite Fluctuations <i>Anton Sysoev and Nikita Voronin</i>		180
Improving the Efficiency of Accident Response Services in Intelligent Transportation and Logistics Systems <i>Sergey Lyapin, Yulia Rizaeva, Dmitry Kadasev and Irina Kadaseva</i>		89
Method for Calculation of Constructive and Mode Parameters of Infrared Heating Unit for Drying of Polymeric Coatings on a Metal <i>Roman Lee, Dmitry Psarev, Anton Melnikov and Andrey Pchelnikov</i>		61
Optimization of traffic control in intelligent transport systems <i>Alexander Galkin</i>		192

Session 19 Industrial and Commercial Power and Power Conversion Systems – Energy Systems and Power Systems Engineering (13:00–14:30)	Chairman Hall Yuri Shurygin 255	ArtID
Problems in the Study of the Equivalent Resistance of the Electrical Low Voltage Networks, Given the Switching Devices <i>Oleg Naumov, Elena Gracheva and Alexey Gorlov</i>		6
Modelling Characteristics of Reliability Low-Voltage Switching Devices on the Basis of Random Checks on the Example of Contactors <i>Oleg Naumov, Elena Gracheva and Alexey Gorlov</i>		7
The Results of the Implementation of the System for Monitoring the Quality of Electricity in Mining Enterprises <i>Alexander Semenov, Mariya Semenova and Oleg Fedorov</i>		93
Combined Piezoelectric Vibroimpact Energy Harvester with Improved Performance <i>Todor Todorov, Stanimir Valchev, Francesc Moll, Nikolay Nikolov and Rumen Nikolov</i>		39
Intelligent Relay Protection of Electric Power Systems <i>Yuri Shurygin</i>		171
Aspects of the Creation of Combined Energy Systems with Alternative Sources <i>Valeriy Telegin</i>		57

Session 20 Industrial and Commercial Power and Power Conversion Systems – Energy Systems and Power Systems Engineering (15:00–17:00)	Chairman Hall Evgeniy Zatsepin 255	ArtID
Analysis of Power Supply Systems' Reliability of According to the Time-to-failure Distribution Functions <i>Violetta Zatsepina, Evgeniy Zatsepin, V Lovchiy and A Krivonosov</i>		182
Electric ARC Plasma Installation with Control Information-Measuring System <i>Victor Meshcheryakov, Vladimir Pikalov, Alexei Evseev, Olga Danilova and Sergey Ambrosimov</i>		117
Improving Efficiency of High-power Plants Through Modernization STATCOM Devices <i>Oleg Shachnev, Violetta Zatsepina and Evgeniy Zatsepin</i>		179

Session 20 Industrial and Commercial Power and Power Conversion Systems – Energy Systems and Power Systems Engineering (15:00-17:00)	Chairman Evgeniy Zatsepin Hall 255	ArtID
Basic Directions of Increase of Power System Fault Tolerance <i>Alexander Shpiganovich, Alla Shpiganovich and Sergey Astanin</i>		176
Quality management of electric power for agricultural consumers <i>Lyudmila Korolyova, Dinara Japarova, Vyacheslav Kalinin, Sergey Kochergin and Alexander Kobelev</i>		173
Low-Temperature Pyrolysis of Poultry Litter for Biofuel Production <i>Rafail Isemin, Alexander Michalev, Natalia Muratova, Vadim Kokh-Tatarenko, Sergey Kuzmin, Dmitry Klimov and Yuri Teplitskii</i>		83
Models and Algorithms for Quick Calculation of Electromechanical Transition Processes of Multi-Machine Electrotechnical Systems <i>Valentina Blyuk, Mikhail Ershov and Alexander Komkov</i>		43
Synthesis high-efficient catalyst to increase power solid oxide fuel cell <i>Denis Obratsov, Elena Obratsova and Vladimir Chernyshov</i>		127

Friday, 22nd, 2019

10:00 – 12:00	Plenary Session	Academic Council Hall
	<i>Viktor MESHERYAKOV, D.Sc., Prof. Russia, Lipetsk, Lipetsk State Technical University</i>	
	Energy-saving Transport Electric Drive Systems <i>Aleksey DAGMAN, Cand.Sc Russia, Lipetsk, Novolipetsk Steel Corporation</i>	
	<i>Denis KOVALEV Russia, Lipetsk, Novolipetsk Steel Corporation</i>	
<i>Vladimer PIMENOV, Cand. Sc., Senior Scientist Russia, Lipetsk, Novolipetsk Steel Corporation</i>		
<i>Anatoly POGODAEV, D.Sc., Prof. Russia, Lipetsk, Lipetsk State Technical University</i>		
Application of Mathematical Modeling Methods in Solving Problems of Improving the Quality of Rolled Products <i>Acronis Cybersecurity and Data Protection</i>		
12:00 – 13:30	IEEE Round Table	
13:30 – 14:00	Closing Ceremony	

UNDER THE AUSPICES OF

