

4th International Conference on
Control Systems, Mathematical Modeling,
Automation and Energy Efficiency



SUMMA2022 CONFERENCE PROGRAM

November, 9-11 2022 | Russia, Lipetsk



SUMMA2022 CONFERENCE

The 4th International Conference on Control Systems, Mathematical Modeling, Automation and Energy Efficiency (SUMMA2022) focuses on the wide range of topics related to Control Systems and Mathematical Modeling, Automation and using advanced knowledge in the Power Industry to solve scientific and practical production problems. Traditionally the conference is jointly organized by V.A. Trapeznikon Institute of Control Sciences RAS and the Department of Automation and Computer Science of Lipetsk State Technical University

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.

SUMMA2022 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; Natural Language Processing*

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*

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Wednesday, November, 9 2022

[Join Opening Ceremony \(via MS Teams\)](#)

10:00 – 10:20 (MSK, UTC+3)	Opening Ceremony	
	Pavel SARAEV, D.Sc., Prof. <i>Russia, Lipetsk, Lipetsk State Technical University</i>	
	Stanimir VALTCHEV, Prof. <i>Portugal, Universidade Nova de Lisboa</i>	
	Dmitry NOVIKOV, Academician of RAS, D.Sc., Prof. <i>Russia, Moscow, V.A. Trapeznikov Institute of Control Sciences RAS</i>	
	Sergey FILIPIEV <i>Russia, Novolipetsk Steel</i>	
10:20– 13:40 (MSK, UTC+3)	Plenary Session	Chair Prof. Stanimir VALTCHEV
	Stanimir VALTCHEV, Prof. <i>Portugal, Universidade Nova de Lisboa</i>	
	The Global Energy Crisis and Renewable Energy as the Hen and Egg Problem	
	Vladimir PIMENOV, Cand.Sc., Senior Researcher <i>Russia, Novolipetsk Steel</i>	
	Mathematical Software for Decision Support System of Rolling Mill Operator	
10:20– 13:40 (MSK, UTC+3)	Semen PODVALNY, D.Sc., Prof. <i>Russia, Voronezh State Technical University</i>	
	Evolutionary Approach to Multi-alternative Control of Complex Objects in Critical Regimes	
	Tatiana LEDENEVA, D.Sc., Prof. <i>Russia, Voronezh State University</i>	
Fuzzy Modeling: New Families of Fuzzy Operations		
10:20– 13:40 (MSK, UTC+3)	Victor MESHCHERYAKOV, D.Sc., Prof. <i>Russia, Lipetsk State Technical University</i>	
	Energy-Efficient Systems of Adjustable Asynchronous Electric Drive for General Industrial Mechanisms and their Application in Electroplasma Installations	
13:40 – 14:30 (MSK, UTC+3)	Coffee Break	
14:30 – 17:15 (MSK, UTC+3)	Section Sessions	

Thursday, November, 10 2022

10:00 – 13:00 (MSK, UTC+3)	Section Sessions
13:00 – 14:00 (MSK, UTC+3)	Coffee Break
14:00 – 16:00 (MSK, UTC+3)	Section Sessions
16:00 – 16:30 (MSK, UTC+3)	Coffee Break
16:30 – 18:00 (MSK, UTC+3)	Section Sessions

Friday, November, 11 2022

10:00 – 12:00 (MSK, UTC+3)	Section Sessions
12:00 – 12:30 (MSK, UTC+3)	Coffee Break
12:30 – 13:00 (MSK, UTC+3)	Closing Ceremony
13:00 – 16:30 (MSK, UTC+3)	Historical tour around Lipetsk

DETAILED PROGRAM
Wednesday, November, 9 2022
(Moscow time, UTC+3)

[Join Session AM1 \(via MS Teams\)](#)

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[Join Session AM2 \(via MS Teams\)](#)

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Thursday, November, 10 2022

(Moscow time, UTC+3)

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[Join Session A1 \(via MS Teams\)](#)

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Session AM.1.3 Industrial Applied Mathematics and Modeling – Mathematical Foundations of Control Theory (16:30-18:00)		Chairs Dr. Dmitriy Poleshchenko	ArtID
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17:45-18:00	<i>Dmitriy Ivanov, Ilya Sandler, Zaineb Yakoub, Victoria Antonova, Michail Terekhin and Lubov Bezyzykova</i> On Instrumental Variable-Based Method for Identification of Permanent Magnet Synchronous Machine by Noisy Data		158

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14:30-14:45	<i>Artem Kudryavtsev, Violetta Zatsepina and Evgenii Zatsepin</i> Laboratory Model of an Automated Smart Home Power and Control System		27
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(Moscow time, UTC+3)

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10:45-11:00	<i>O Dorofeeva, D Nikolsky and K Potapova</i> Mathematical Modeling of the Process of Changing the Groundwater Level by the Method of Discrete Features in the Presence of Semi-Permeable Inclusions and a Drainage System		176
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11:45-12:00	<i>Svetlana Zhikhoreva, Anatoly Pogodaev and Galina Krylova</i> Formation if the Control Structure of an Educational Organization of Higher Education		193

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10:30-10:45	<i>Elmaddin Mamedov, Svetlana Suslova, Elena Kalmykova and Igor Tsyganov</i> Automation of Technology for Obtaining Pectin Metal Complexes		166
10:45-11:00	<i>Anastasia Dianova, Maria Zhidkova, Olga Farafonova and Olga Shashkanova</i> Optimization of Operating Parameters for the Determination of Normalized Components in Thin Films Based on Trivalent Chromium and Titanium by the FP Method RFA		169

13:00 [Join Closing Ceremony \(via MS Teams\)](#)