



14-15th November, Niš, Serbia

FINAL PROGRAM

SESSIONS OVERVIEW

Thursday, November 14 th , 2024		
<i>Time</i>	<i>Activities</i>	<i>Place</i>
10:30 – 11:00	Registration	Hall 457
11:00 – 11:30	Opening Ceremony	Hall 457
11:30 – 12:30	Plenary Session	Hall 457
12:30 – 13:30	Welcome Cocktail	Hall 154
13:30 – 15:00	Session A: Control Systems, Mechatronics and Robotics	Hall 155
13:30 – 15:00	Session B: Information and Communication Technologies	Hall 156
15:00 – 16:30	Session C: Artificial Intelligence and Generative AI Models	Hall 155
15:00 – 16:30	Session D: Applied Mathematics, Measurements & Instrumentation	Hall 156
19:00	Conference Dinner	<i>Etno kuća "Biser" Niš</i>

Friday, November 15 th , 2024		
<i>Time</i>	<i>Activities</i>	<i>Place</i>
10:00 – 11:30	Session E: Manufacturing and Information Technologies	Conf. hall 155
10:00 – 11:30	Session F: Machine Learning and Neural Networks	Conf. hall 156
11:30 – 13:00	Session G: Conventional and Renewable Energy Systems	Conf. hall 155
13:00 – 15:00	Project Session: ERASMUS + and HORIZON Projects Presentation	Conf. hall 155
15:00	Conference Closing	



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S A U M 2024
SYSTEMS. AUTOMATIC CONTROL AND MEASUREMENTS

14th-15th November, Niš, Serbia

CONFERENCE VENUE

All activities during the conference will be held at the **Faculty of Electronic Engineering in Niš**, street Aleksandra Medvedeva 4, 18104 Niš (<https://goo.gl/maps/NhdxL8KzsaxeScQt7>)

Conference dinner will be organized in the Serbian traditional restaurant Etno kuća “Biser” Niš (<https://maps.app.goo.gl/DH8jmwymy2r7vyRC6>)

Hall 457 – This conference hall is located on the 4th floor in the new building of Faculty of Electronic Engineering

Hall 154 – The Cocktail Hall is located on the 1st floor in the new building of Faculty of Electronic Engineering

Hall 155 – This conference hall is located on the 1st floor in the new building of Faculty of Electronic Engineering

Hall 156 – This conference hall is located on the 1st floor in the new building of Faculty of Electronic Engineering



CONTENT

Thursday 14th November, 2024

Plenary Session Thursday, 14th November, 11:30 – 12:30 (local time)		
Plenary Session	P1 • Invited paper	pp.
Sergiu-Dan Stan, Emil Teuțan, Alin Pleșa, Tudor Scripor, Marius Mureșan, Irina Mureșan Empowering Learning: The Future of Assistive Technologies in Education		
Plenary Session	P2 • Invited paper	pp.
Jianxun Cui, Boyuan Zhao Adaptive Cooperative Control of Multi-Traffic Signal Based on Multi-Agent Reinforcement Learning		
Plenary Session	P3 • Invited paper	pp.
Vesna Blagojević, Aleksandra Cvetković, Predrag Ivaniš, Jelena Manojlović Integrated Satellite-Aerial-Terrestrial Networks for Data-Collecting in IoT System with Wireless Powering		

Session A – Control Systems, Mechatronics and Robotics Thursday, 14th November, 13:30 – 15:00 (local time) <i>Chairperson: Prof. Dr. Boban Veselić</i>		
Session A	A1 • Regular paper	pp.
Vladimir Sibinović, Vladimir Mitić, Anđela Jovanović, Darko Mitić Design and Simulation of a Model Predictive Controller for a Balancing Robot		
Session A	A2 • Regular paper	pp.
Larisa Rybak, Vladislav Cherkasov, Artem Voloshkin, Anna Nozdracheva New Design of a Multirobotic System for Automation of Work with Biomaterials		
Session A	A3 • Regular paper	pp.
Sergey Khalapyan, Rybak Larisa Aleksandrovna, Artem Voloshkin, Vladislav Cherkasov The Methodology for Calculating and Analyzing the Parameters of the Tripod Robot to Ensure Controllability in the Workspace		



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Session A	A4 • Regular paper	pp.
Anđela Jovanović, Vladimir Mitić, Vladimir Sibinović, Boban Veselić Modeling, Control and Simulation of Differential Drive Mobile Platform		
Session A	A5 • Regular paper	pp.
Anđela Đorđević, Jianxun Cui, Marko Milojković, Staniša Perić Comparative Analysis of DC Motor Vibration Signal for Discrete and Continuous State Feedback Control of a Modular Servo System		
Session A	A6 • Regular paper	pp.
Dušan Stojiljković, Ivan Ćirić, Stevica Cvetković, Rajko Turudija, Danijela Srećković Data-Driven Approaches for Intelligent Control in District Heating Systems		
Session A	A7 • Regular paper	pp.
Darko Mitić, Zoran Milić A Comparative Study of PID controllers and Lead-Lag Compensators for Ship Roll Stabilization		

<u>Session B – Information and Communication Technologies</u> <u>Thursday, 14th November, 13:30 – 15:00 (local time)</u> <i>Chairperson: Prof. Dr. Zoran Perić</i>		
Session B	B1 • Regular paper	pp.
Milena Frtunić Gligorijević, Miloš Bogdanović, Leonid Stoimenov An Analysis of Concept Lattice uUsability for Open Data Categorization within Evolving Metadata Environment		
Session B	B2 • Regular paper	pp.
Sofija Perić, Aleksandra Jovanović, Zoran Perić, Jelena Nikolić Performance Analysis of Two-stage Uniform Quantization of Laplacian Data		
Session B	B3 • Regular paper	pp.
Vladan Vučković The Lira 2024 Project		
Session B	B4 • Regular paper	pp.
Karl Benkič Been Hacked Yet? Strategies to Stay Safe and Protected		
Session B	B5 • Regular paper	pp.
Sebastijan Šprager, Karl Benkič		



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Initiating a High-Performance Graphical Library for Next Generation Metrel Instruments		
Session B	B6 • Regular paper	pp.
Jianxun Cui, Xin Zhou, Marko Milojković, Miroslav Milovanović, Staniša Perić LiDAR-Camera Feature-Level Fusion in Autonomous Driving Perception: A Survey		
Session B	B7 • Regular paper	pp.
Valentina Nejковиć, Stevica Cvetković, Luka Stojadinović, Đorđe Đorđević Design and Implementation of a Web-based Energy Data Visualization Platform Using Supabase and NextJS Frameworks		

<u>Session C – Artificial Intelligence and Generative AI Models</u> <u>Thursday, 14th November, 15:00 – 16:30 (local time)</u> <i>Chairperson: Prof. Dr. Marko Milojković</i>		
Session C	C1 • Regular paper	pp.
Jelena Kocić, Miloš Bogdanović, Milena Frtunić Gligorijević, Leonid Stoimenov Adjusting Tokenizer Training for Domain-Specific Large Language Models - The Case of Serbian Legal Domain		
Session C	C2 • Regular paper	pp.
Nenad Petrović, Elida Suljović, Nemanja Zdravković, Suad Suljović, Goran Đorđević LLM-based Network Experimentation: Channel Capacity of MRC Diversity Receiver in κ-μ Fading Environment Case Study		
Session C	C3 • Regular paper	pp.
Jianxun Cui, Huidong Gao, Miroslav Milovanović, Staniša Perić, Marko Milojković A Review of Trajectory Prediction for Autonomous Vehicles Based on Generative Models		
Session C	C4 • Regular paper	pp.
Nenad Petrović Leveraging LLM-Based Services in Legacy Information Systems		
Session C	C5 • Regular paper	pp.
Bratislav Lukić, Goran Petrović An Innovative Framework for Traffic Light Control Based on the Combined Use of Artificial Intelligence and Multi-Criteria Decision Making		
Session C	C6 • Regular paper	pp.
Jianxun Cui, Xiang Li, Staniša Perić, Marko Milojković, Miroslav Milovanović A Comprehensive Review of Main Methods in Autonomous Driving Behavior Decision-Making		



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Session D – Applied Mathematics, Measurements & Instrumentation

Thursday, 14th November, 15:00 – 16:30 (local time)

Chairperson: Prof. Dr. Jelena Jovanović

Session D	D1 • Regular paper	pp.
Jelena Jovanović, Dragan Denić, Dragan Živanović, Ivana Ranđelović, Milan Dinčić, Goran Miljković Nonlinearity Compensation of an Angular Position Encoder Using a Compact Linearization Circuit		
Session D	D2 • Regular paper	pp.
Ivana Ranđelović, Goran Miljković, Jelena Jovanović, Milan Dinčić, Dragan Denić Examination of the Application of an Optical Module with a Linear Array of Photodetectors in Optical Position Encoders		
Session D	D3 • Regular paper	pp.
Nikola Danković, Saša S. Nikolić, Dragan Antić, Miodrag Spasić Orthogonal Polynomials - Development and Design		
Session D	D4 • Regular paper	pp.
Dušan Simjanović, Dragan Antić, Saša S. Nikolić, Branislav Ranđelović The Fuzzy AHP Ranking of Industry 4.0 Smart Manufacturing Technologies Criteria		
Session D	D5 • Regular paper	pp.
Miodrag Spasić, Xiaolei Li, Dragan Antić, Nikola Danković, Jelena Petrović, Nebojša Jotović Orthogonal Functions based Model Predictive Control of Magnetic Levitation System		
Session D	D6 • Regular paper	pp.
Jelena Nedeljković, Goran Nikolić, Tatjana Nikolić, Sandra Đošić Utilizing Logical Implications for Verifying Accuracy of Exponentiation Functions in Embedded Systems through XOR Operation		
Session D	D7 • Regular paper	pp.
Sandra Veljković, Nikola Mitrović, Miloš Marjanović, Emilija Živanović, Vojkan Davidović, Goran Ristić, Danijel Danković Stress-Induced Degradations and Self-Heating Effects in P-Channel Power VDMOS Transistors		



Friday 15th November, 2024

<u>Session E – Manufacturing and Information Technologies</u> <u>Friday, 15th November, 10:00 – 11:30 (local time)</u> <i>Chairperson: Prof. Dr. Miloš Madić</i>		
Session E	E1 • Regular paper	pp.
Marko Milojković, Vojislav Miltenović, Zoran Nikolić, Dragan Antić, Staniša Perić, Milan Banić, Miroslav Milovanović, Miodrag Spasić, Aleksandar Miltenović, Dragana Dimitrijević Jovanović On the Experience of Joint Mechanical and Electronic Education in the Field of Smart Products and Services Engineering		
Session E	E2 • Regular paper	pp.
Rajko Turudija, Marko Ignjatović, Branka Radovanović, Dušan Stojiljković, Ivan Ćirić, Mina Mirović Exploring the Relationship Between Environmental Factors and Energy Output in a District Heating System		
Session E	E3 • Regular paper	pp.
Miloš Madić, Milan Trifunović, Saša Nikolić, Nikola Danković Development and Solving of Constrained Laser Cutting Optimization Model		
Session E	E4 • Regular paper	pp.
Milan Nikolić, Milan Banić, Milan Pavlović, Vukašin Pavlović, Aleksandar Miltenović Prediction of the Friction Coefficient based on the Hysteresis Value of Rubber		
Session E	E5 • Regular paper	pp.
Miša Tomić, Miloš Simonović, Miloš Milošević, Vukašin Pavlović Precise Heading Estimation of Physically Connected Off-road Robotized Vehicles in the RoboShepherd System		
Session E	E6 • Regular paper	pp.
Lazar Stojanović, Miloš Simonović, Damjan Rangelov, Marko Perić, Natalija Miljković Optimizing Energy Efficiency in Agricultural Mulchers: A Review of Fuzzy Control System		



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Session F – Machine Learning and Neural Networks

Friday, 15th November, 10:00 – 11:30 (local time)

Chairperson: Prof. Dr. Ivan Ćirić

Session F	F1 • Regular paper	pp.
Natalija Ivković, Isidora Jovanović, Mirjana Perić, Ana Vučković Prediction of Microstrip Line Characteristic Impedance using Different Machine Learning Methods		
Session F	F2 • Regular paper	pp.
Anđela Đorđević, Saša S. Nikolić, Miodrag Spasić, Jelena Petrović Application of Convolutional Neural Networks for Motor Fault Diagnosis: An overview		
Session F	F3 • Regular paper	pp.
Nikola Ivačko, Ivan Ćirić, Ljiljana Radović, Žarko Ćojbašić Implementation of Genetic Algorithms in Convolutional Neural Networks for Object Detection and Classification		
Session F	F4 • Regular paper	pp.
Miljana Milić, Miljan Jeremić, Jelena Milojković, Duško Lukač Comparative Analysis of Machine Learning Models for Prediction of Reference Evapotranspiration		
Session F	F5 • Regular paper	pp.
Milica Tasić, Ivan Ćirić, Marko Ignjatović, Dušan Stojiljković Comparison of Various Machine Learning Methods for Heat Load Prediction in District Heating System		
Session F	F6 • Regular paper	pp.
Jelena Petrović, Miroslav Milovanović, Jianxun Cui, Milan Banić Comparison of YOLOv5 and YOLOv8 Neural Networks for Grape Recognition		

Session G – Conventional and Renewable Energy Systems

Friday, 15th November, 11:30 – 13:00 (local time)

Chairperson: Prof. Dr. Sanja Aleksić

Session G	G1 • Regular paper	pp.
Bojan Banković, Filip Filipovic, Nebojša Mitrović, Milan Radić, Vojkan Kostić Sound-Based Speed Estimation of the Three-Phase Induction Motor		
Session G	G2 • Regular paper	pp.
Vladan Vučković		



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The Power Supply System for Fluorescent Lamps Using Direct Pulsing Current		
Session G	G3 • Regular paper	pp.
Jovan Vukašinić, Nebojša Mitrović, Saša Štatkić, Bojan Banković, Filip Filipović Verification of the two Stage PSO Algorithm for Induction Motor Parameter Identification with offline Frequency Converter Identification Procedure		
Session G	G4 • Regular paper	pp.
Nebojša Mitrović, Filip Filipović, Bojan Banković, Vojkan Kostić, Saša Štatkić, Jovan Vukašinić Comparison of Self Commissioning Procedure for Frequency Controlled Induction Motor Drive Parameter Identification		
Session G	G5 • Regular paper	pp.
Aleksandar Pantić, Adriana Petković, Neda Branković, Teodora Denić, Sanja Aleksić, Dragan Pantić Comprehensive Analysis of Solar PV Systems: A Dual Approach with PVSyst and Matlab/Simulink		
Session G	G6 • Regular paper	pp.
Milena Rajić, Maria Tsami, Zorana Stanković, Peđa Milosavljević Life Cycle Assessment and Intelligent Energy Systems - a Review of Tools for Sustainable Development		
Session G	G7 • Regular paper	pp.
Vesna Jovanović, Dragoslav Janošević, Jovan Pavlović, Nikola Petrović Regulation of Hydraulic Pumps in the Drive System of Hydraulic Excavators		

<u>Project Session</u>	
<u>Friday, 15th November, 13:00 – 15:00 (local time)</u>	
<i>Chairperson: Miloš Simonović</i>	
1.	Transforming Advanced Water Skilling Through the Creation of a Network of Extended-Reality Water Emulative Centres (WATERLINE), HORIZON, 101071306-HORIZON-WIDERA-2021-ACCESS-05
2.	Instantaneous Infrastructure Monitoring by Earth Observation (IIMEO), HORIZON, HORIZON-CL4-2022-SPACE-01-13: End-to-end earth observation systems and associated services
3.	Space-based Applications for Transport Monitoring and Management (SPATRA), HORIZON EUROPE RIA
4.	Platform for Career Development of Researchers in Europe (ERA TALENT)- HORIZON-WIDERA-2022-ERA-IBA
5.	Nexus Twinning Research and Innovation Institutions to Design and Implement Inclusive GEPs, HORIZON-WIDERA-2022-ERA-01-81 - Support to the Implementation of Inclusive Gender Equality Plans



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6.	Curricula Innovation in Climate-smart Urban Development Based on Green and Energy Efficiency with the Non-academic Sector (SMARTWB), ERASMUS, ERASMUS-EDU-2022-CBHE-STRAND-2
7.	Advancing the Integration of Soft Skills in Higher Education for Water (SKILLS4WATER), ERASMUS, KA220-HED-2023
8.	Transport of Dangerous Goods – Modernization of Curricula and Development of Trainings for Professionals in the Western Balkans HEIs (DGTRANS), ERASMUS, ERASMUS-EDU-2022-CBHE-STRAND-2
9.	Collaborative e-platform for Innovation and Educational Enhancement in Medical Engineering (Callme), ERASMUS, 2022-1-RO01-KA220-HED-000087703
10.	BIOMEDIX - Biomedical Innovations through Digital Transformation of Additive Technologies and Knowledge Exchange; 2024 - 2027
11.	Strategic Higher – Education Initiative for Networking and Engineering: Innovative Concurrent Engineering Methodologies and Teaching Scenarios (SHINE), ERASMUS
12.	Workplace and Process Safety in Next Generation Europe – Teaching for Learning (Safety4EU), Erasmus+ Jean Monnet Module, ERASMUS-JMO-2023-HEI-TCH-RSCH
13.	Smart Products and Services Engineering (SPaSE), Erasmus+ Jean Monnet Module, 101047566-JMO-2021-HEI-TCH-RSCH
14.	Multilevel Approach to Study Chronic Wounds Based on Clinical and Biological Assessment with Development of Novel Personalized Therapeutic Approaches Using in Vitro and in Vivo Experimental Models, Science Fund of Republic of Serbia (CHRONOWOUND), PRISMA program, Science Fund of the Republic of Serbia.
15.	Explainable AI-assisted Operations in District Heating Systems (XAI4HEAT), PRISMA program, Science Fund of the Republic of Serbia.