



SAINT PETERSBURG ELECTROTECHNICAL

UNIVERSITY «LETI»

***XXVI International Conference
on Soft Computing and Measurements***

SCM`2023

PROGRAMME OF CONFERENCE



24-26 may 2023

Saint Petersburg

XXVI International Conference on Soft Computing and Measurement (SCM'2023)
May 24 - 26, 2023
Saint Petersburg Electrotechnical University "LETI", St. Petersburg, Russia.

May 24, 2023

May 24, 2023 video conference room, Zoom 1

9:00 - 10:00 Registration, testing Zoom

10:00 - 12:20 Plenary session

10:00 - 10:20 Conference greetings

Sheludko V.N.

Yurish S.

Prokopchina S.V.

Plenary:

10:20 - 10:40

Methodological Foundations of Linguistic Measurements of Non-numerical Characteristics of Complex Objects

Prokopchina S. V.

10:40 - 11:00

Promising directions for the development of robotic systems

Viksnin I. I., Kupriyanov M. S.

11:00 - 11:20

New directions in measurement theory and measurement practice. Based on the materials of the conferences ARCI - 2023, ASPAI- 2022.

Yurish S.

11:20 - 11:40

Artificial intelligence systems in marketing. Methods for testing artificial intelligence systems in marketing.

Berezin A. S.

11:40 - 12:00

Explainable artificial intelligence in medical image analysis: state of the art and prospects

Volkov E. N., Averkin A. N.

12:00 - 12:20

Dark Ship detection: SAR Images

M S Prasad, Shivani Verma, Shichkina Y.A.

12:20 - 12:45 Coffee break

May 24, 2023, 12:45-13:45, video conference room, Zoom 1

Session 1. General Measurement Theory. Metrology, Measures and Scales. Uncertainty in Measurements.

Methodology of Bayesian Intellectual Measurements for Information Systems and its Application to the Study of the Value System of Russian Youth

Bormotov I.V., Prokopchina S.V., Zhukov R.A.

Analysis of Step Structure when Moving on Stairs by Linear Acceleration Signals

Vera S. Konovalova, Pavel G. Korolev, Violetta Mamykova

Algorithmic Support for Calculating the Density of the Probability Distribution of a Random Variable at the Output of the Measuring Path

N.D. Barashkov, N.V. Romantsova

Investigation of a Random Number Generator Built into the LabVIEW Graphical Development Environment

Oleg A. Mikus, Elena S. Suloeva

May 24, 2023, 13:45-15:15, video conference room, Zoom 1

Session 2. Probabilistic Methods in Information Processing. The Bayesian Approach.

Approaches to Accounting for the Uncertainty of Data on the Time of Realization of Episodes in Models for Assessing the Characteristics of Individual's Episodic Behavior

Valeriya F. Stoliarova, Tat'yana V. Tulupyeva

Statistical Comparison of the Running Times of Global Posteriori Inference Algorithms in Algebraic Bayesian Networks

Artyom A. Vyatkin, Alexander L. Tulupyev

The Relationship between the Cattell Test and Users' Social Network Subscriptions

Grigorii E. Ryazantsev, Valerii D. Oliseenko, Maxim V. Abramov

Evaluation of the potential refinement of the results of multiple measurements with asymmetric distribution, achieved by considering the relationships between the measurands

Garanin V.A., Semenov K.K.

May 24 2023, 14:00-17:00, room 5333, Zoom 2

Session 11. Artificial Intelligence and Measurements in Industry, Ecology and Economics.

Robot control with imitation of animal behavior

A. I. Mamyako, K. A. Porokhnenko, I. Polyakov

Investigation of the characteristics of a sparse linear antenna array

Vladimir Yu. Volkov, Nguyen Viet An

The Analysis of Greenhouse Gas Emissions Rates for the Environmental Exposure Control System

V. V. Alekseev, N. V. Orlova, V. A. Saranseva, V. S. Brizgalo

Nonparametric Simulation Model for the Law of Error Propagation

Gorokhov V. L., Brusakova I.A., Gainutdinov R.

Nonparametric Simulation Model for the Law of Error Propagation

Pablo D. Badillo, Aleksandr E. Degterev

System-dynamic modeling of an economy decarbonization strategy

Oleg I. Dranko, Aleksey S. Bogomolov, Alexander F. Rezhnikov, Anatoliy D. Tsvirkun, Iraida A. Stepanovskaya

Inelastic Seismic Response of RC Buildings: an Artificial Neural Network Model. Jan Alexis B. Monsalud, Dante L. Silva

Promising approaches to improve the security of artificial intelligence systems

Artem B. Menisov, Aleksandr G. Lomako

Software reliability modeling and prediction of residual defects for embedded systems

Elena V. Dushutina

Intelligent Analysis of Optical Microscopy Images for Microfluidic Synthesis Results

Alexandr A. Alexandrov, Alexandr N. Nebaba, Oleg O. Kartashov, Dmitry S. Polyanichenko, Sofja S. Polyanichenko, Maria A. Butakova

Application of Analytical Design of Aggregated Regulators Method to Toxin-Producing Phytoplankton Models

Aleksandra Shchegoleva, Mark Polyak

May 25, 2023

May 25, 2023, 10:00-14:00, video conference room, Zoom 1

Session 3. Systems Simulation. Complex Objects Control Under Uncertainty.

Nonlinear Control Methods for Complex Plants Under Uncertain Conditions

A.A. Kuznetsov, V.N. Sheludko, V.V. Putov, T.L. Rusaeva, Nguyen Zui Khanh

Development of Methods for Modeling Action Planners of Intelligent Information Agents

Larisa K. Ptitsyna, Nidal El Zabayar Shevchenko, Nikita A. Ptitsyn, Mikhail P. Belov

Comparative analysis of the use of control systems with a predictive model of various configurations on the example of a hydraulic stand

Dmitriy Melnik, Roman Barashkin, Vladimir Popadko

An application of a relative gain array and singular value decomposition for the synthesis of control systems for multivariable processes

Ivan Tsekhmestruk, Roman Barashkin, Vladimir Popadko

Adaptive-robust control of a tricopter-type unmanned aerial vehicle with rotary propellers under uncertain conditions

Duy Khanh Nguyen, V. V. Putov, A. A. Kuznetsov, M. A. Chernyshev

Gas turbine selective control system

V. N. Sheludko, P. V. Sokolov, O. A. Andrievsky, N. V. Andrievskaya

Search of the Optimal Mining Transport Route Applying Parallel Computing Technologies

Alena N. Iliushina, Igor' M. Novozhilov

Development of the Railroad Switch Electric Drive Mathematical Model for the Neural Network

Alena N. Iliushina, Natal'ja A. Shatilova, Igor' M. Novozhilov

Investigation of Popov's Lines' Limiting Position to Ensure the Process Control Systems' Absolute Stability

Alexander V. Martirosyan, Karina V. Martirosyan, Alexander B. Chernyshev

Design of fish-like biomorphic propulsion

Dmitriy S. Goryunov, Vyacheslav G. Rybin, Timur I. Karimov, Georgii Yu. Kolev, Artur I. Karimov

Mathematical Simulation of the Formation Pressure Monitoring System in the Water-Drive Gas Reservoir

Artem V. Plotnikov, Vyacheslav E. Trushnikov, Dmitry A. Pervukhin, Mikhail Y. Shestopalov

- Modification of the Space Vector Pulse-Width Modulation Algorithm for a Three-Phase Inverter Using an Oblique Coordinate System
S. Al Moustafa, B. Ahmed, B.S. Bala, A.V. Domnin, P.N. Primachenko, A.N. Prokshin
Advantage of Applying Image Analysis Methods Using Intelligent Agents in Decision-making Systems
- Elena E. Kotova, Ivan A. Pisarev, Andrei S. Pisarev
Control System of Synchronous Generator Wind Turbine
- Liudmila P. Kozlova, Olga A. Kozlova
Synthesis of a Neural Control System for a Multi-drive Industrial Machine
- Alexander M. Belov , Mikhail P. Belov
The concept of a decision-making system to confirm the identity of the client
- P. A. Shelupanova, P. Y. Davydchenko, R. M. Muromtsev, D. V. Ivanova, M. A. Cholokogly, S. A. Chudina
Decision support system for integrated geo-information environmental monitoring
- Andrey A. Privalov, Vadim. A. Kolesov, Vladimir. I. Veremiev
Possibility application of stand- alone wind energy conversion system under the climatic conditions of Iraq.
- Saeed M.D., Sedighi Mehdi
Models in the process of designing complex microelectronic objects under conditions of uncertainty
- Sergey. E. Mironov, Pavel M. Shiryaev, Olga Y. Kaidanovic

May 25, 11:00-13:30, room 5221, Zoom 2

Session 12. Artificial intelligence systems for integrative physiology

- Astronomical Image Processing: Exoplanet Detection.
Prasad M S, Verma Shivani, Shichkina Y.A
Preparation of Patient Mammogram Images for Segmentation
- Esther Chiadikaobi Ugwueke, Dimitrios Palogiannidis
Multifractal Analysis of Heart Rate Variability for Arrhythmia Diagnostics
- Karina S. Starchenkova, Lyudmila A. Manilo
Building a system to optimize the resources of medical organizations
- Michael Eirich, Valerii D. Oliseenko
A system for determining pathologies on chest radiographs based on convolutional neural networks and image processing using fuzzy sets
- N. E. Staroverov, A. Yu. Gryaznov, I.G. Kamyshanskaya , K.K.Guk, E.D. Kholopova, I.A. Larionov
Development of a control system for patients with ventricular arrhythmias
- Dmitry N. Klypin
Building a model of a patient state based on machine learning methods in a fog computing environment
- Alexey Subbotin, Nataly Zhukova, Pham Tuan Anh
Opportunity of artificial intelligence for clinical and laboratory diagnostics of inflammatory bowel diseases
- Irina Rasmagina, Igor Bakulin, Gleb Mashevskiy, Natalya Sheliakina, Anton Nikolaev
Development of a method for standardization of units of measurements in the algorithm of the combined method of dopplerography in assessing the biomechanical properties of blood
- German A. Kosach, Petr N. Afonin

A prototype for a moving platform for acquiring images of the spine during walking
Anagheem Ibrahim, Housam Hasan Bou Issa

May 25, 14:00-17:00, room 5221, Zoom 2

Session 5. Models and Methods for Artificial Intelligence Systems. Cognitive Systems.

Possibilities of Explainable Artificial Intelligence for Glaucoma Detection Using the LIME Method as an Example

Egor N. Volkov, Aleksej N. Averkin

Impact of Hyperparameter tuning on Solar PV Performance using Machine Learning for Moscow, Russia

Kingsley Okoli, Hastrup Adebayo Ibukun, Innocent Joseph, Onah Uche, Victor Achirgbenda

Application of Neural Network Keyword Extraction Methods for Student's CV Compilation from Discipline Work Programs

Ivan I. Kholod, Pavel V. Korytov, Maria V. Sorochina

Model of a Self-Healing Computing Process of a Cloud Computing System Under Conditions of Information and Technical Impacts

Artyom A. Balyabin

Analysis Of Artificial Intelligence Methods And Algorithms For Processing Data As A Series Of Signals

Pavel Y. Belyaev, Elena L. Sheinman, Iuliia V. Kim, Ilya I. Viksnin, Sergei S. Chuprov

The research of AutoML methods in the task of wave data classification

Evgenii A. Neverov, Iliia I. Viksnin, Iuliia V. Kim, Sergei S. Chuprov, Elena L. Sheinman

An approach to the definition of system intelligence in the management of complex systems

Vladimir S. Simankov, Pavel Yu. Buchatskiy, Stefan V. Onishchenko, Semen V. Teploukhov

Biological metaphor for cyber immunity

Natalie M. Grigorieva, Sergei A. Petrenko

"Artificial intelligence" Vs "human intelligence": a new ethics of technological development

Gennady A. Shcherbakov

Finding Traces of Music Education on Facial Images

Yana Senichenkova, Mark Polyak

FPGA-based hardware implementation of the ART-1 classifier

Olga I. Bureneva, M S Prasad, Shivani Verma

May 25, 2023, 17:00-18:15, room 5221, Zoom 2

Session 4. Neurocomputing Networks and Neurotechnologies.

Session 13. Application of Methods and Systems of Artificial Intelligence and Measurements in Agricultural Complexes for Sustainable Development of Territories

Implementation of memory elements and combinational logic in the class of pyramidal neural networks of fast learning

A.Yu. Dorogov

Evaluation of the Effectiveness of Neural Networks Based on the Criteria for Completing the Object Classification Task

Nikita O. Tursukov , Ilya I. Viksnin, Evgeny A. Neverov , Elena L. Sheinman, Sergei S. Chuprov

Lane Marking Semantic Segmentation Using Convolutional Neural Networks

A. R. Muzalevskiy, E. V. Serykh, M. M. Kopichev, E. V. Druian, M. A. Chernyshev

Predicting the outcome of moderate and severe COVID-19 with anti-inflammatory therapy

Sukhomlinova I.M. , Bakulin I.G. , Kabanov M.Yu

May 26, 2023

May 26, 2023, 10:00-10:40, video conference room, Zoom 1

Session 7. New Approaches in Measurements: Intellectual, Soft and Fuzzy Measurements.

Automatic Report Generation in the NI LabVIEW Graphical Programming Environment in the Study of Human Kinematic Portrait

Tat'yana V. Tyulkina, Anna V. Tsareva, Dmitriy B. Popov

May 26, 2023, 10:40-12:30, video conference room, Zoom 1

Session 8. Intelligent Measurements Systems and Sensors.

Multichannel Adaptive Registration Device

Evgeniy M. Antonyuk, Peter E. Antonyuk , Dmitry S. Gvozdev

The appearance of the information-measuring system for qualimetry of personal protective equipment against aircraft noise

Sergey P. Dragan, Aleksey V. Bogomolov, Sergey V. Drozdov

Principles of building a digital model of a functional territorial geotaxon using GIS technologies

Vladimir. V. Alekseev, Natalya. V. Orlova, Vera. S. Bryzgalov, Roman. E. Vavilov, Veronika. A. Sarantseva

Designing a cross-platform Web-application for human kinematic portrait analysis

A.K. Chikin, A.V. Tsareva, V.E. Porodko

Building a distributed measuring system using the Modbus TCP protocol

Ya.A. Tyarkin, N.V. Romantsova

Induction motor diagnosis based on machine learning

Savelii Salnikov, Evgeniy Solodkiy, Denis Vishnyakov, Rostislav Iudin, Anton Petrochenkov

May 26, 2023, 12:30-13:30, video conference room, Zoom 1

Session 9. Technologies and Systems BIG DATA, Data Science, Business Intelligence.

A study of the relationship between personality type and factors influencing career choice

A. O. Khlobystova, M. V. Abramov

Determine the Number of Distributed Big Data Storage Replicas

Tatyana M. Tatarnikova, Evgeny D. Arkhiptsev

On the issue of individualization of educational trajectories in the management of knowledge control (based on Big Data)

Natalia A. Loyko, Anton B. Petrochenkov, Aleksandr G. Leisle

Models for Building Information and Analytical Tools for Cyber-Physical Systems of Fuel and Energy Enterprises

D. P. Plakhotnikov, E. E. Kotova

May 26, 2023, 13:30-15:30, video conference room, Zoom 1

Session 10. IoT and Industrial 4.0. Technologies and Systems.

Application of Bayes networks in the design of the information system «Mineral water deposit»

Karina V. Martirosyan, Alexander B. Chenyshev, Alexander V. Martirosyan

Wireless Sensor Network Clustering Model

Tatyana M. Tatarnikova, Nikita S. Mokretsov

Development of an intelligent information system «Smart deposit» for mineral water resource

Vladimir V. Mishin, Valentina V. Tcapleva, Elena V. Myasnikova, Anastasiya A. Makarova

Application of Attack Graphs to Simulate the Violation of the Movement of Vehicles in the Convoy

Fatkieva R.R.

Forming work scenarios for monitoring a dynamic computer network

Maxim Avilov, Yulia Shichkina

Dynamic Model of Structural Optimization of Software Development Process due to R&D Center and Developer Advocate

Andrey S. Belyaev, Felix A. Desyatirikov, Elena N. Desyatirikova

Dynamic Model of Structural Optimization of Software Development Process due to R&D Center and Developer Advocate

Andrey S. Belyaev, Felix A. Desyatirikov, Elena N. Desyatirikova

May 26, 2023, 13:40-15:30, room 5419, Zoom 2

Session 6. Fuzzy Methods and Systems.

Power consumption of embedded neuro-fuzzy systems

S. M. Morozov, M. S. Kupriyanov

Synthesis of Control Systems for the Stabilization of the Course of an Autonomous Underwater Vehicle Based on the Application of the Method ANFIS

Pham Van Tuan

Experimental Testing of Heuristic Methods for Solving Problems of Vector Bin Packing of Cargoes in Containers

Maksim S. Esin, Anastasiya A. Korepanova, Artyom A. Sabrekov

Useing of Fuzzy Algorithms in Intelligent Systems
Liudmila P. Kozlova, Olga A. Kozlova

May 26, 2023, 15:30-16:00, video conference room, Zoom 1
Summarizing. Closing of the conference.

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