XXVI International Conference on Soft Computing and Measurements

SCM`2023

PROGRAMME OF CONFERENCE

IEEE

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. Rezchikov, 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. Rusyaeva, Nguyen Zui Khanh
Development of Methods for Modeling Action Planners of Intelligent Information Agents
Larisa K. Ptitsyna, Nidal El Zabayar Shevchenco, 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 management 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, Haastrup 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 , Ilia 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, Dmitrij 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. Bryzgalo, 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 resourse

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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