

2021 Ural Symposium on Biomedical Engineering, Radioelectronics and Information Technology (USBEREIT 2021)

**Yekaterinburg, Russia
13 – 14 May 2021**



**IEEE Catalog Number: CFP21P00-POD
ISBN: 978-1-7281-7692-5**

**Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP21P00-POD
ISBN (Print-On-Demand):	978-1-7281-7692-5
ISBN (Online):	978-1-7281-7691-8

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Page	Authors	Title
0001-0004	Karagoz Ahmet , Guvenis Albert	Predicting the Grade of Clear Cell Renal Cell Carcinoma from CT Images Using Random Subspace-KNN and Random Forest Classifiers
0005-0008	Zhdanov Aleksei, Evdochim Lucian, Borisov Vasili, Dorosinskiy Leonid, Negodyaev Konstantin	Correlation Between Blood Pressure and Body Mass Index for Transfusion Therapy Setup
0009-0011	Manilo Lyudmila , Starchenkova Karina	Recognition of sleep apnea by EEG using nonlinear dynamics methods
0012-0015	Sergeev Timofey , Danilova Anastasiia, Tikhonenkova Oksana	Research Of Systems For Monitoring The Position Of The Cervical Spine
0016-0019	Dembovskiy Maxim , Nikulina Svetlana, Kosorukov Artem	Development of a biotechnical magnetoplethysmography system for monitoring respiratory rate and heart rate
0020-0023	Lyakhova Ulyana , Lyakhov Pavel	Method of Cleaning Hair Structures for Intellectual Image Classification of Skin Neoplasms
0024-0026	Filimonov Viacheslav, Mozgovi Sergei, Kononov Alexei, Parygina Mariya	The Process of Finding of Simple Solutions to Support Diagnostic Decisions in Medical Research on the Example of Chronic Gastritis Stage Assessment
0027-0029	Gerashchenko Sergey, Udaltsova Ekaterina, Demidov Andrey	Development of the System for Assessment of Periodontal Tissue State
0030-0032	Salimgareev Dmitrii , Yuzhakova Anastasia, Lvov Alexander, Zhukova Liya, Korsakov Alexander	Development of new infrared crystals of the AgBr - AgI system for medicine
0033-0035	Yuzhakova Anastasia , Korsakov Alexander, Salimgreev Dmitrii, Lvov Alexander, Zhukova Liya	Simulation of Infrared Photonic Crystal Fibers for Laser Medicine at a Wavelength of 10.6 μm
0036-0040	Pletenkova Anastasiya, Ragozin Andrey	Processing of Heart Rate Signals Using Digital Spectral Analysis on the Plane of Complex Frequencies When Estimating the Reactivity of Regulation Mechanisms of the Human Physiological System
0041-0044	Evdakova Ekaterina , Nemirko Anatoly, Manilo Ludmila	Recognition of dangerous rhythm disturbances from short ECG fragments
0045-0048	Alimuradov Alan	Speech/Pause Segmentation Method Based on Teager Energy Operator and Short-Time Energy Analysis
0049-0052	Negodyaev Konstantin, Zhdanov Aleksei, Dorosinskiy Leonid	Storage and Thawing Requirements for Blood Products in Russian Federation and CIS Countries

0053-0055	Negodyaev Konstantin, Zhdanov Aleksei, Dorosinskiy Leonid, Borisov Vasilii	Overview and Comparative Analysis of Plasma Thawing System
0056-0059	Rodina Anastasia , Anishchenko Lesya	Analysis of Mouse Motor Activity in Free Behavior by Bioradiolocation
0060-0062	Koscheeva Ekaterina , Chupov Alexey , Slastnikov Kirill , Konstantinova Anna	Non-Contact Temperature Mapping for Neonatal Intensive Care Unit
0063-0065	Konstantinova Anna, Koscheeva Ekaterina, Slastnikov Kiril, Chupov Alexey	Thermal Scanner for Neonatal Intensive Care Unit Based on Pyrometer
0066-0069	Spivak Alexey, Demin Igor, Lisin Artem, Rykhtik Pavel, Safonov Dmitriy	Examination of the Calibrated Blue Phantom BP1901 using Shear Wave Elastography
0070-0073	Solieman Hanadi , Ripka Darina, Yuldashev Zafar	Investigation of the Transformation Methods Accuracy of 12-Lead ECG to Orthogonal Leads Using Multiple Error Evaluation Metrics
0074-0077	Gurevich Boris, Zaichenko Kirill	Acousto-Optic Devices Application for Bioelectric Signals Wavelet Processing
0078-0081	Gurevich Boris, Zaichenko Kirill, Kordyukova Anna	Method of Reliable Electrocardiographic Control of Ischemia Appearance in Investigations with Experimental Animals
0082-0085	Slizov Valeriy , Anishchenko Lesya	Estimation of the Optimal Radar Positioning for the Contactless Fall Detection
0086-0089	Goidina Tatiana, Kobelev Alexander, Shchukin Sergey, Gulyaev Yury, Luzhnov Petr, Leonhardt Steffen	Stand for Determining the Forearm Tissues Resistivity in-Vivo
0090-0093	Anisimov Aleksei , Novikova Tatyana, Kuropatenko Maria, Sagirov Arlan, Suvorov Nikolay	Research Method of Human Cardiovascular, Respiratory and Nervous Reaction Complex in Response to Dynamic Postural Loads
0094-0097	Anisimov Aleksei , Sagirov Arlan, Guseva Nadezhda, Agapova Elizaveta, Shabrov Alexander	Electrophysiological Technique for Exploring Cerebral Hemodynamics and Brain Bioelectrical Activity During Postural Changes
0098-0101	Al-harosh Mugeb, Laryushkin Arseny	Model-based Assessment of Brachial Artery Diameter From Electrical Impedance Measurement
0102-0105	Gerzhik Anastasiia, Kobelev Alexander, Luzhnov Petr, Volkov Alexander	Transthoracic Electrical Impedance Test Signal Generation and Potential Use of Optocoupler

0106-0109	Ganeeva Yulia , Myasnikov Evgeny	Augmentation in neural network training for person identification by iris images
0110-0112	Drozhhennikova Ekaterina, Kobelev Alexander, Sergeev Igor	Development of an Instrumentation Amplifier for Rheographic Measurements
0113-0116	Hammoud Ahmad , Tikhomirov Alexey, Shaheen Zein	Automatic Bio-impedance Signal Analysis: Smoothing Processes Efficacy Evaluation in Determining the Vascular Tone Type
0117-0120	Volkov Ivan, Radchenko Gleb	Architecture of mHealth Platform for Storing, Exchanging and Processing of Medical Data in Smart Healthcare
0121-0124	Parnovskaya Anastasia , Briko Andrey	Evaluation of the Forearm Electroimpedance Myography Formation Mechanisms Based on Physical Modeling
0125-0128	Shcherbachev Andrew, Kudashov Ivan, Itkin George, Galyamov Airat, Bychkov Eugene	Determination of Electrode Assembly Parameters for Electroimpedance Measurement of AHV Volume
0129-0132	Briko Andrey, Kapravchuk Vladislava, Selutina Svetlana, Shchukin Sergey, Gulyaev Yury , Leonhardt Steffen	Amplitude Parameters of Electrical Impedance Myography with Different Pressure of the Electrode System Research
0133-0136	Pnev Sergey , Tulupov Andrey, Berikov Vladimir	Modified U-net with Different Attention Mechanisms for Acute Ischemic Stroke Segmentation using Non-Contrast CT
0137-0140	Dmitriev Alexander , Gremitskiy Ivan, Levadny Ivan	The Influence of Vibro-Tactile Finger Stimulation Parameters on P300 Characteristics Changes for Rehabilitation: Pilot Study on Healthy Subjects
0141-0144	Dmitriev Alexander , Minenko Irina, Popova Victoria	Temporal and Spatial Parameters Dynamics of SSVEP During Long-Term Low-Frequency LED Stimulation: Pilot Study
0145-0148	Kust Sergei, Markova Maria	An algorithm for determination of terrain type in the lower limb prosthesis control
0149-0152	Dmitriev Alexander , Haddad Nekoula, Levadny Ivan	Analysis of P300 Features for Target Stimulus Detection Using Artificial Neural Network with Small Dataset for BCI Tasks
0153-0156	Tikhomirov Alexey, Briko Andrey, Seleznev Nikolay, Petrosyants Arman, Shchukin Sergey	Comparison of elliptical and spherical geometric model of the heart for computer multichannel electrical impedance cardiography
0157-0160	Spirkin Andrey , Berdibayeva Gulmira, Bodin Oleg, Bezborodova Oksana	Features of Speech Commands Recognition Using an Artificial Neural Network

0161-0164	Kalmykov Nikolai , Alexandrov Andrey, Ryazantsev Pavel, Reschetov Igor, Kudashov Ivan	Development of an Experimental Setup for Intraoperative Angiography
0165-0168	Derevyankin Dmitriy, Karpuhin Valeriy, Maksimov Stepan, Skudarnov Petr, Sokolova Elizaveta, Navshirvanova Elina	Development of a Biological Tissue Relaxation Frequency Analyzer During Electrosurgical Action
0169-0172	Solieman Hanadi , Yuldashev Zafar, Ripka Darina, Nemirko Anatoli	Study of the Ventricular Late Potentials Characteristics of the Patients with Heart Conducting Ways Abnormality
0173-0176	Kurmukov Anvar , Proskurov Vladislav, Pisov Maxim, Belyaev Mikhail	Fast Lung Localization in Computed Tomography by a 1D Detection Network
0177-0180	Lipchak Daria , Chupov Alexey, Soldatchenkov Alexander	SENSOREX: Review on saturation extraction algorithms on demand of low-cost optical pulse oximetry
0181-0184	Zhorina Larisa, Stepanova Inna , Zmievskey Grigoriy	Hand Skin Temperature after Local Cold Test: Thermal Imaging Observation and Mathematical Computation
0185-0189	Taha Adnan, Shabunin Sergey	Design Six Band patch Antenna for 5G and Radar Applications
0190-0193	Klevtsov Sergei	Plane Conversion Characteristic Model for Microprocessor Pressure Sensor
0194-0197	Shishkin Mikhail , Mitelman Yuriy	Automated Design of Parabolic Reflector Antennas using MATLAB and Antenna Toolbox
0198-0201	Shishkin Mikhail , Shabunin Sergey	Design of a New Antenna System for a Meteorological Radiosonde Tracking Radar
0202-0205	Tissen Olga , Sai Sergey	Evaluation Quality Service of a Digital Broadcasting Station with Automatic Equipment Backup
0206-0209	Tarkov Mikhail	Two-Gate FeFET SPICE Model and Its Application to Construction of Adaptive Adder
0210-0213	Budyldina Nadezda , Trukhin Mixail, Ovchinnikov Dmitrii	QUASI-Optimal Algorithms for Detecting a Groups Target with a random number of elements
0214-0217	Titaev Alexander , Makhovik Nikita , Putin Mikhail , Toropov Dmitry , Fomin Alexey , Bezlepkin Daniil	Dynamic algorithm for non-uniform deployment based on route graph in mobile sensor networks
0218-0221	Cheranyov Alexander , Dukhan Evgeny	Methods of detecting small unmanned aerial vehicles
0222-0224	Panchenko Stepan , Cheranev Alexander	Interception wideband FM signals with RTL-SDR

0225-0227	Fomin Dmitr, Dudarev Nikolay, Darovskikh Stanislav, Klygach Denis, Vakhitov Maksim	The Volume-Modular Technology in the Design of Passive Microwave Devices
0228-0230	Lantsov Vladimir , Papulina Anna	Algorithms for Software Tools with Harmonic Balance Method
0231-0233	Lantsov Vladimir	Algorithm of Solving for RF Circuit Equations by Using the Tensor Decompositions
0234-0237	Salomatov Yury , Stankovsky Andrey, Litinskaya Yelena, Nemshon Andrey, Polenga Stanislav	Synthesis of Spatial Band-Pass Filter Based on Frequency- Selective Surfaces
0238-0240	Baranov Alexandr , Babaev Rufat, Latypov Ruslan, Davydov Yuriy, Chupin Mikhail	Synchronous Cable Sensing Network
0241-0244	Kusaykin Dmitriy, Klevakin Maxim	A Novel Algorithm for Reconstruction of the Arbitrary Finite Duration Periodic Signals
0245-0246	Isaeva Anastasia , Latypov Ruslan , Baranov Alexandr, Gatina Rosa	Multichannel data receiver system
0247-0250	Titov Konstantin , Korchagin Yury, Zavalishina Olga	Distinguishing between two ultra-wideband quasi-radio signals with unknown amplitudes and initial phases
0251-0254	Grigoryeva Svetlana , Alimkhanova Aslima, Grigoryev Egor, Gyorok Gyorgy	Integration of the Data Transmission Function into Light- Emitting Diode Lighting Systems
0255-0258	Bokov Alexander , Shishmintsev Denis, Slizkoy Valery	Microwave Signal Processing for Contactless Monitoring of Material Surface Parameters
0259-0263	Chernikova Evgeniya , Belousov Anton	Quasi-static analysis of shielded multiconductor transmission lines for triple modal reservation
0264-0266	Kleshnina Sofya , Belyaev Boris, Boev Nikita, Burmitskikh Anton, Podshivalov Ivan	Measuring Unit for the Observation of Hysteresis Loops in Thin Ferromagnetic Films
0267-0271	Burmitskikh Anton , Belyaev Boris, Boev Nikita, Kleshnina Sofya	Automated Measuring System for Studying Ferromagnetic Resonance Spectra in the Radio Frequency Range
0272-0275	Preobrazhenskiy Andrey , Lvovich Igor, Lvovich Yakov, Preobrazhenskiy Yuriy, Choporov Oleg	Development of a combined approach to create complex electrodynamic structures with specified performance requirements
0276-0279	Akhpashev Ruslan, Drozdova Vera	The 5G Planning Scenarios Affection on MAC-layer Scheduler Efficiency

0280-0284	Brovko Tatiana , Chugunov Alexander, Malyshev Alexander, Korogodin Ilya, Petukhov Nikita , Glukhov Oleg	Complex Kalman Filter Algorithm For Smartphone-based Indoor UWB/INS Navigation Systems
0285-0288	Voronkov Grigory, Lopukhova Ekaterina, Lakman Irina , Zhitnikov Vladimir, Kuznetsov Igor	A codec simulation for low-rate speech coding with radial neural networks
0289-0292	Bezgin Aleksandr , Savochkin Aleksandr	The Patch Circular Polarization Antenna for Autonomous Marine Platforms
0293-0296	Drozdova Vera, Zavyalova Darya, Akhpashev Ruslan	The 5G Control Resource Set #0 software development issues
0297-0300	Chernoskutov Mikhail	Data Structure for Faster Graph Processing
0301-0304	Filimonov Viacheslav, Kulikova Oksana, Usacheva Elena, Shmyga Irina	Identification of Patterns of Development of the Incidence of Covid-19 in OECD Countries Using Cluster Analysis
0305-0307	Pavlova Ulyana, Rakitskiy Anton	Development and Research of the Time Series Prediction Method Based on Finite State Automaton
0308-0311	Sheka Andrey , Samun Victor	Rotation augmentation for head pose estimation problem
0312-0315	Gashnikov Mikhail , Kuznetsov Andrey	Increasing the size of the camouflage area for remote sensing images
0316-0318	Morozova Kristina , Rakitskiy Anton	Development and Research of Neural Network Based Method for Reconstructing Audio Signals
0319-0323	Andriyanov Nikita , Dementiev Vitaly, Gladkikh Anatoliy	Analysis of the Pattern Recognition Efficiency On Non-Optical Images
0324-0326	Gashnikov Mikhail	Hierarchical Representation of Plain Areas of Post-Interpolation Residuals for Image Compression
0327-0329	Glotov Arseny , Lyakhov Pavel	Pulmonary Fibrosis Progression Prognosis Using Machine Learning
0330-0333	Timoshenkova Yulia , Safiullin Nikolai, Porshnev Sergey	About influence of weight initialization algorithms on accuracy of the forecast with LSTM-net for harmonic signals
0334-0336	Saifutdinov Denis	Results of the analysis of passenger traffic in various types of tariff structures
0337-0340	Sinadskiy Alexey , Domukhovskiy Nikolay	Formal Model and Algorithm for Determining Classification Features and Anomalous Behavior of Network Nodes

0341-0344	Aksyonov Konstantin , Zhavoronkov Alexander, Sitnikov Igor	Multiagent approach of the demand side management within the Microgrids
0345-0349	Kurnosov Mikhail , Tokmasheva Elizaveta	Optimizing Barrier Algorithms on Asymmetric Subsystems of NUMA Machines
0350-0353	Svetlakov Mikhail, Hodashinsky Ilya, Slezkin Artem	Gender, Age and Number of Participants Effects on Identification Ability of EEG-based Shallow Classifiers
0354-0357	Bardamova Marina , Hodashinsky Ilya	Hybrid algorithm for tuning feature weights in a fuzzy classifier
0358-0361	Papulovskaya Nataliya, Volchkov Valery, Asiryany Valery	Weyl-Heisenberg Transform Capabilities in JPEG Compression Standard
0362-0366	Efimov Alexandr, Polyakov Artem, Kramarenko Konstantin, Pavsky Kirill	Key-value database access optimization for PMIx standard implementation
0367-0370	Zavalishchin Dmitry , Vakolyuk Kirill	Algorithm for Parallel Parcels Delivery Service
0371-0374	Sevastianova Natalia , Ivanov Oleg, Vinogradova Nina	Algorithm for Recognition of Unidentified Multispectral Remote Sensing Data
0375-0378	Aksyonova Olga , Zhuravlev Alexander, Rubin Oleg	Investigation of Route Completion Time in Dependence on Transport Network Parameters Using Computer Modelling
0379-0382	Solodushkin Svyatoslav, Sagoian Arsen, Varga Bogdan	Energy consumption prediction of Electric Vehicle air conditioning system using Artificial Intelligence
0383-0386	Syskov Alexey, Klimov Dmitrii , Rabovskaya Maria , Kozlov Vladislav	Timetable model for self regulated learning based on student agent level restrictions resolving
0387-0390	Ushenin Konstantin, Garnik Varedzhan, Yurkov Kirill	Anomaly Detection in Image Datasets using Convolutional Neural Networks, Center Loss, and Mahalanobis Distance
0391-0394	Sozykin Andrey, Koshelev Anton , Bersenev Alexander, Shadrin Denis, Aksenov Alexander, Kuklin Evgeniy	Developing Educational Programs Using Russian IT Job Market Analysis
0395-0398	Makarova Olga , Porshnev Sergey	Mathematical model of the computer attack implementation possibility by an intruder
0399-0402	Makarova Olga	Determining the choice of attack methods approach
0403-0406	Nechta Ivan	Cryptographic Scheme for Group Passwords Distribution in Steganographic Systems
0407-0410	Mishchenko Evgeniy, Sokolov Alexandr	Model of Identification of a Person in Databases of Various Sizes
0411-0414	Kanner Andrey, Kanner Tatiana	Special Features of TLA+ Temporal Logic of Actions for Verifying Access Control Policies

0415-0418	Beliaev Dmitry	Hidden Technical Channels Of Information Leakage: Terminology, Classification
0419-0422	Zolotykh Maxim	Study of Crawlers of Search Engine ‘Shodan.io’
0423-0426	Galimzyanova Liliya , Gilmiyarov Roman , Porshnev Sergey	The concept of allocating access rights to virtual memory area in Linux-based operating systems
0427-0430	Medvedev Artem, Gazizov Talgat	Studying the circuit switching order after failures for a shielded structure with triple modal reservation
0431-0435	Mikhailova Vasilisa, Shulika Maria, Basan Elena, Peskova Olga	Security architecture for UAV
0436-0439	Nestor Vladimir , Zulkarneev Iskander	Feedback-based greybox fuzzing of EtherCAT industrial protocol
0440-0443	Maro Ekaterina , Girichev Vadim, Us Ivan	Power Analysis of Kuznyechik cipher on Arduino Nano board
0444-0446	Chernova Olga	Information security definition within the humanitarian aspect
0447-0450	Telny Andrey Viktorovich, Kuznetsova Anna, Romanova Alina	On the Functional Reliability of the Physical Access Control System
0451-0454	Pepelyaev Pavel , Chernikov Arseniy, Yakin Nikita, Zhitkov Mikhail	Implementation of GOST 34.12-2018 encryption for LoRaWAN end-devices
0455-0458	Yakin Nikita , Zhitkov Mikhail, Chernikov Arseniy, Pepelyaev Pavel	Security threats and service degradation detection in LoRaWAN networks
0459-0462	Semenova Xenia, Knyazeva Natalia	Forensic Analysis of 2GIS Navigation App Installed on an Android-Based Smartphone
0463-0466	Agafonov Anton , Petrenkov Denis	Anomaly Detection in Vehicle Platoon with Third-Order Consensus Control
0467-0470	Alabugin Sergei , Sokolov Alexander	Applying of Recurrent Neural Networks for Industrial Processes Anomaly Detection
0471-0473	Leonov Pavel , Vorobyev Alexandr, Ezhova Anastasia, Kotelyanets Oksana, Zavalishina Aleksandra, Morozov Nikolay	The Main Social Engineering Techniques Aimed at Hacking Information Systems
0474-0477	Makarova Olga , Lihota Maxim	Simulation of Computer Attack Scenarios For Industrial Robots rfrom The Intruder Point Of View
0478-0480	Sokolov Alexander , Pyatnitsky Ilya	Determination of the Optimal Ratio of Normal to Anomalous Points in the Prombel of Detecting Anomalies in the Work of Industrial Control Systems.

0481-0484	Fartushnyi Andrey , Lebedev Sergey, Kollerov Andrey	Security Profiles` Formation Peculiarities of Telecommunication Equipment at Objects of Critical Information Infrastructure
0485-0487	Dyachkova Irina , Rakitskiy Anton	Development of the Remote Anonymous Voting System and the Analysis of its Vulnerabilities
0488-0490	Zulkarneev Iskander , Kozlov Andrey	New Approaches of Multi-agent Vulnerability Scanning Process
0491-0495	Parfenov Denis , Bolodurina Irina, Zabrodina Lubov, Zhigalov Arthur	Development of a Solution for Identifying Network Attacks Based on Adaptive Neuro-Fuzzy Networks ANFIS
0496-0499	Kuznetsov Andrey	A New DELF-based Car Recognition Algorithm For Automatic Gate Access CCTV Systems
0500-0502	Subbotin Stanislav, Volchkov Dmitry, Zabokritski Alexander, Dymova Elena	Justification of the Relevance of Developing a Test Program for Special Studies of the DisplayPort Interface