

2015 International Conference on Biomedical Engineering and Computational Technologies (SIBIRCON 2015)

**Novosibirsk, Russia
28 – 30 October 2015**



**IEEE Catalog Number: CFP1511E-POD
ISBN: 978-1-4673-9112-2**

**Copyright © 2015 by the Institute of Electrical and Electronic 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP1511E-POD
ISBN (Print-On-Demand): 978-1-4673-9112-2

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

Table of Contents

Linguistic view on brain-computer-interface, <i>Mariya Timofeeva</i>	1
Remote monitoring of children with asthma, being treated in multidisciplinary hospital, <i>Leyla S. Namazova-Baranova, Elena V. Antonova, Alexey I. Molodchenkov,</i> <i>Vladimir I. Smirnov, Elena A. Vishneva</i>	7
Bioengineering system for research on human emotional response to external stimuli, <i>Filatova Natalya Nikolaevna, Terekhin Sergey Alexeevich</i>	13
Microcubes aided photonic jet scalpel tips for potential use in ultraprecise laser surgery, <i>Oleg V. Minin, Igor V. Minin, Nikita Kharitoshin</i>	18
Feasibility of a capnometry device for respiratory biofeedback in patients undergoing coronary artery bypass Graft surgery, <i>O.V. Grishin, V.V. Gulyaeva, M.I. Zinchenko,</i> <i>D.Y. Uryumtsev, I.G. Zhilina, V.G. Grishin</i>	22
Readiness for Boron neutron capture therapy, <i>B. Bayanov, V. Burdakov, A. Ivanov, D. Kasatov,</i> <i>J. Kolesnikov, A. Koshkarev, A. Kuznetsov, A. Makarov, Yu. Ostreinov, E. Sokolova, I. Sorokin,</i> <i>T. Sycheva, S. Taskaev, I. Shchudlo, V. Byvaltsev, Yu. Gavrilova, V. Kanygin, A. Kichigin,</i> <i>M. Zdanova, A. Yarullina, S. Gromilov, S. Frolov, S. Lezhnin, R. Muhamadiyarov, L. Zaidi</i>	27
Development of automated methods for the critical condition risk prevention, based on the analysis of the knowledge obtained from patient medical records, <i>Chimit Naydanov, Dmitriy</i> <i>Palchunov, Polina Sazonova</i>	33
Effect of electron-beam irradiation on electrospinning produced scaffolds, <i>A.O. Stepanova, M.V. Korobeinikov, A.S. Yunoshev, P.P. Laktionov</i>	39
An ontological-based monitoring system for patients with bipolar I disorder, <i>Chryssa H. Thermolia, Ekaterini S. Bei, Euripides G. M. Petrakis,</i> <i>Vangelis Kritsotakis, Vangelis Sakkalis</i>	43
Problems of investigations in sphere of electromagnetic fields impact on biological objects, <i>Anna V. Busygina, Maxim E. Komnatnov, Olga A. Matveyenko</i>	50
Influence of colorstimulation on situational anxiety of first-year students, <i>Yatsenko M.V., Kaigorodova N.Z., Prokhorov N.V., Rastyagaeva O.V</i>	55
Multiplex detection of IgG class antibodies to toxoplasma gondii, rubella virus, cytomegalovirus and herpes virus using a novel multiplex flow immunoassay, <i>Sergey Dolgushin,</i> <i>Sergey Selishchev, Ekaterina Loseva, Elena Odintsova, Andrey Tronin</i>	57
Nanostructured calcium phosphate coatings for medical implants, <i>Berkin Alexander B., Deryabina Vera V., Veselov Sergei V.</i>	59
Digital assistance services for emergency situations in personalized mobile healthcare: smart space based approach, <i>Dmitry G. Korzun, Alexander V. Borodin, Ivan A. Timofeev,</i> <i>Ilya V. Paramonov, Sergey I. Balandin</i>	62

Development of microbicide equipment and research in pathogen inactivation by cold argon plasma, <i>A. Semyonov, B. Baldanov, Ts. Ranzhurov, E. Nikolayev, S. Gomboyeva</i>	68
Multifunctional clinical decision support system based on clinical practice guidelines, <i>GI Nazarenko, DA Sychev, EB Kleymenova, SA Payushik, AI Akhmetova, LP Yashina</i>	72
Patient-specific 1D model of the human cardiovascular system, <i>Kiselev I. N., Kolpakov F. A., Biberdorf E. A., Baranov V. I., Komlyagina T. G., Suvorova I. Y., Melnikov V. N., Krivoschekov S. G.</i>	76
Principles of organization and control of multielectrode neuro-electrostimulation device, <i>V.S. Kublanov, M.V. Babich</i>	82
Researching the possibilities of remote photoplethysmography application to analysis of time-frequency changes of human heart rate variability, <i>V.S. Kublanov, K.S. Purtov</i>	87
Features of the radiophysical complex MRTHR signals in research of functional processes in the brain tissues, <i>V.S. Kublanov, V.I. Borisov</i>	93
Application of track membranes in electrodes for electrical neurostimulation, <i>V.V. Trofimov, D.Y. Kukushkin, A.M. Vasilev, I.A. Arhipushkin, V.S. Kublanov, M.V. Babich, A.Y. Dolganov, V.M. Gadelshin</i>	99
Comparison of system capacity of 4G cellular networks for different scheduling algorithms, <i>Darya V. Zavyalova</i>	102
Clustering of independent components of EEG in determining individual characteristics of reactions related to a moral choice, <i>A.V. Bocharov, S.A. Bogomaz, A.N. Savostyanov, G.G. Knyazev, A.V. Budakova, M.S. Zaleshin, T.N. Astakhova</i>	104
Numerical solution of inverse problem for secretion and kinetics of C-peptide model, <i>S.I. Kabanikhin, D.A. Voronov, O.I. Krivorotko, A. Yu. Belonog, A.I. Ilyin</i>	108
Diagnostic nanoprobe based on the conjugates of quantum dots and single-domain antibodies for cancer biomarkers detection in immunohistochemistry and flow cytometry, <i>Alyona Sukhanova, Jean-Marc Millot, Michel Pluot, Jacques H.M. Cohen, Igor Nabiev, Klervi Even-Desrumeaux, Patrick Chames, Daniel Baty</i>	113
Multiphoton imaging of tumor biomarkers <i>in situ</i> using highly oriented conjugates of single-domain antibodies and quantum dots, <i>Alyona Sukhanova, Hilal Hafian, Michel Pluot, Jacques H.M. Cohen, Jean-Marc Millot, Igor Nabiev, Marc Turini, Patrick Chames, Daniel Baty</i>	119
The potential of lasing in quantum dots for sensing and diagnostic applications, <i>Sergey Dayneko, Igor Nabiev</i>	122
Active exoskeleton tracking control system design via singular perturbation technique, <i>Valery D. Yurkevich</i>	124

Prediction of osmotic airway hyperresponsiveness in patients with bronchial asthma using adaptive neuro-fuzzy network, <i>Victor P. Kolosov, Nikolay S. Bezrukov, Denis Ye. Naumov, Yuliy M. Perelman, Anna G. Prikhodko</i>	130
Automatic text classification and property extraction, <i>Anton Kolonin</i>	133
Computable cognitive model based on social evidence and restricted by resources, <i>Anton Kolonin</i>	138
The influence of surface alloying with tantalum or silicon on cytocompatibility of titanium nikelid, <i>Matveev Andrey, Matveeva Vera and Lyudmila Artemieva, Lyudmila Meisner, Sergey Meisner</i>	143
Diagnostic use of the resistive device in COPD patients, <i>O.V. Grishin, V.V. Gulyaeva, D.Y. Uryumtsev, M.I. Zinchenko, V.G. Grishin</i>	146
System synthesis of a testbench for testing modules and control systems of lower-limb prostheses, <i>Alexander Poliakov, Marina Kolesova, Pavel Bugayov, Nikolai Lozinskiy, Evgeni Norik, Pavel Gadkov, Olena Chepeniuk</i>	150
Classification of mental tasks using support vector machine based on linear predictive coding and new mother wavelet transform, <i>Mohamed Moustafa Azmy Gad</i>	156
Independence of AP propagation velocity to transjunctional voltage dependence of gap junctional coupling, <i>Shailesh Appukuttan, Rohit Manchanda</i>	160
Innovative technologies in the study of articulatory acoustic bases of indigenous ethnoses of Siberia, <i>I. Selyutina, T. Ryzhikova, N. Urtegeshev, A. Dobrinina, A. Letyagin, A. Shevela</i>	165
Digraph based medical treatment planning, <i>Mark Sh. Levin</i>	171
Computer modeling of stress-strain state of the intact portion of the coronary artery with circular irregular stenosis, <i>Zaretskiy Alexey P., Bogomolov Alexey V.</i>	176
A numerical algorithm of parameter estimation for dynamic model for HIV infection of CD4+ T cells, <i>Sergey Kabanikhin, Olga Krivorotko, Adele Mortier, Dmitriy Voronov, Darya Yermolenko</i>	180
Stochastic simulation of fluctuation-induced enzyme kinetics in vicinity of traps, based on probabilistic tunneling and diffusion mechanisms, <i>K.K. Sabelfeld</i>	186
Application of a depth image analysis algorithm to automatic social behaviour estimation of laboratory animals, <i>Kulikov Victor A.</i>	191
Modified Wiener filter, <i>Sazonov V.V., Shcherbakov M.A., Vasilyev V.A.</i>	193
Fundamental frequency evaluation subsystem for natural speech rehabilitation software calculation module for cancer patients after larynx resection, <i>Kharchenko S.S., Mescheryakov R.V., Volf D.A., Balatskaya L.N., Choinzonov E.L.</i>	197

A computer information system for genetic data analysis on the basis of a permutation test, <i>Kovalevsky V.V., Khairtdinov M.S., Yakimenko A.A., Grishchenko M.V.</i>	201
Software system for the diagnosis of the spine diseases using case-based reasoning, <i>Dmitriy Palchunov, Gulnara Yakhyaeva, Olga Yasinskaya</i>	205
Case-based reasoning in clinical processes using clinical data banks, <i>V.L.Malykh, D.V.Belyshev</i>	211
Searching and using of time intervals of brain activity in a problem of solving process by estimation of negentropy of EEG, <i>Kirill Chagin, Alexander Savostyanov</i>	217
The comparison of automatic artifact removal methods with robust classification strategies in terms of EEG classification accuracy, <i>Pavel Merinov, Mikhail Belyaev, Egor Krivov</i>	221
Mathematical modeling of the tumor markers network, <i>Voropaeva O.F., Shokin Yu.I., Nepomnyaschchikh L.M., Senchukova S.R.</i>	225
Personalized mathematical modeling of cerebral arterial aneurysms, <i>A. K. Khe, A. P. Chupakhin, A. A. Cherevko, D. V. Parshin, A. L. Krivoshapkin, K. Yu. Orlov</i>	230
Exploration of the dynamics of brain activity in the conditions of executive control by means of the EEG method under using of the DLP and 3LCD projectors, <i>Alexander N. Savostyanov, Alexander E. Saprygin, Sergey S. Tamozhnikov, Andrey V. Bocharov</i>	233
Study of the traffic channel blocking probability in multiservice LTE networks, <i>Andrey V. Andreev, Vera G. Drozdova, Alexander V. Loshkarev</i>	236