2023 Fifth International Conference Neurotechnologies and Neurointerfaces (CNN 2023)

Kaliningrad, Russia 18 – 20 September 2023



IEEE Catalog Number: CFP23AU3-POD ISBN: 979-8-3503-4406-6

Copyright © 2023 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:
 CFP23AU3-POD

 ISBN (Print-On-Demand):
 979-8-3503-4406-6

 ISBN (Online):
 979-8-3503-4405-9

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



CONTENTS

Aksiotis Vladislav, Voskoboynikov Alexey, Ossadtchi Alexey, Tumyalis Alexey Optimal decision-making duration	4
Alshanskaia Evgeniia, Martynova Olga Eye tracking and autonomic nervous system responses. A machine learning approach to understanding cognitive stress	8
Blagovechtchenski Evgeny, Gnedykh Daria, Tsvetova Diana, Mkrtychian Nadezhda, Kostromina Svetlana Oscillations in the electroencephalogram reflect the learning of abstract and concrete concepts	12
Butorova Anastasia, Koryukin Egor, Nurullina Nelli, Bobakov Veniamin, Sergeev Aleksandr Mono vs stereo modes of visual-auditory sensory substitution in spatial localization task	16
Gordleeva Susanna, Grigorev Nikita, Savosenkov Andrey, Udoratina Anna, Kiselev Anton, Antipov Vladimir, Badarin Artem Mechanical feedback variant in BCI	20
Grigoreva Anastasia, Kondratenko Alla, Gorin Aleksei, Shestakova Anna Context-dependent P2 plasticity dynamics in the monetary incentive delay task	23
Ivanova Marina, Germanova Ksenia, Petelin Dmitriy, Ragimova Aynur, Ruiz Maria Herrojo Decision making, belief updating and motor performance in bipolar disorder: an MEG study	27
Koriakina Maria, Agranovich Olga, Bermúdez-Margaretto Beatriz, Ulanov Maksim, Shestakova Anna, Blagovechtchenski Evgeny Verbal fluency and semantic association deficits in children with upper limb motor disorders	30
Kosonogov Vladimir, Ntoumanis Ioannis, Hajiyeva Gullu, Kuskova Olga, Jaaskelainen Iiro The cost of emotion regulation: A study of electomyographic and cardiac markers	35
Kustova Tatiana, Vodneva Alena, Oreshina Galina, Golovanova Irina, Zhukova Marina, Grigorenko Elena Interbrain synchrony during Mentor-Mentee verbal interaction. Preliminary results of EEG-hyperscanning study	39
Lebedeva Albina, Maltseva Ksenia, Barabash Nikita, Sokolov Rostislav, Rozov Andrey, Levanova Tatiana The effect of astrocytes in synaptic transmission and rhythmogenesis in hippocampus	42
Lipkovich Mikhail, Knyazeva Veronika, Aleksandrov Aleksander, Shanarova Nadezhda, Sagatdinov Artur, Fradkov Alexander Evoked potentials detection during self-initiated movements using machine learning approach	47
Marasanova Ekaterina, Vedunova Maria, Mitroshina Elena Effect of activation of the 5-HT 4 receptor system on the calcium activity of neuron-glial networks in vitro	51
Pakhomov Aleksandr, Sotskov Vladimir, Mitroshina Elena, Vedunova Maria, Anokhin Konstantin, Ivanchenko Mikhail, Krivonosov Mikhail Evaluation of the activity of neuron-astrocytic networks by the equivalent rewiring probability of the calcium signal propagation dynamic graph	55
Ragimova Ainur, Vorobiova Alicia Nunez, Imanaeva Madina, Feurra Matteo exploring the association between excitatory and inhibitory indices and the mirror neuron system by transcranial magnetic stimulation of the primary motor cortex	59
Romanchuk Natalia, Sergeeva Mariya, Shirolapov Igor, Zakharov Alexander, Komarova Yuliya, Pyatin Vasiliy EEG correlates of the human brain biological age	62
Rusinova Anna, Volodina Maria, Ossadtchi Alexei Improvement in psychological	64

well-being and changes in brain and autonomic nervous system activity in novices after taoist meditation training	
Semenova Nadezhda Controlling the number of spikes in FitzHugh–Nagumo system under periodic forcing	68
Sergeeva Marya, Korovina Ekaterina, Bannov Victor, Shirolapov Igor, Zakharov Alexander, Pyatin Vasiliy, Khivintseva Elena, Romanchuk Natalia Eeg monitoring under the exposure of light in the spectrum of maximum activation of intrinsically photosensitive retinal ganglion cells	71
Sergeeva Mariya, Korovina Ekaterina, Komarova Yuliya, Shirolapov Igor, Zakharov Alexander, Pyatin Vasiliy, Alekseeva Alexandra, Romanchuk Natalia, Pavlova Olga Perception of virtual reality stimulus of personalized and indifferent content using the oddball paradigm	73
Shirolapov Igor, Pyatin Vasiliy, Zakharov Alexander, Sergeeva Mariya, Romanchuk Natalia, Komarova Yuliya Neuromuscular rehabilitation does not cause immunosupression in elderly patients without neurodegenerative diseases	75
Stasenko Sergey Mean-field model of tripartite synapse with infected glial cells	78
Stasenko Sergey, Kazantsev Victor Covid olfactory dysfunction model	82
Stasenko Sergey, Kazantsev Victor Model of astrocyte regulation of spike-timing-dependent plasticity	86
Stasenko Sergey, Levanova Tatiana Mean-field model of glia-mediated appearance of brain rhythms in normal and pathological conditions	90
Stepasyuk Vasilisa, Kazantsev Victor, Lobov Sergey The synergy of synaptic scaling and internal homeostatic plasticity	96
Timokhov Victor, Zinchenko Oksana, Klucharev Vasily An investigation of neural dynamics of the prefrontal cortex in decision-making under uncertainty	100
Tsybina Yuliya, Kastalskiy Innokentiy, Andreev Andrey, Frolov Nikita, Gordleeva Susanna, Hramov Alexander Epileptiform activity in a neuron-astrocyte network model	104
Udoratina Anna, Grigorev Nikita, Savosenkov Andrey, Ermolaev Denis, Maksimenko Vladimir, Gordleeva Susanna Functional TMS mapping during sensorimotor integration task	108
Ushakov Vadim Cognitive systems and processes in behavior, physiology and modeling	111
Vanina Anastasia, Sychev Alexander, Proskurkin Ivan, Postnikov Eugene Revealing types of transport regimes for organometallic markers spreading in a collagen-based brain parenchyma's phantom	114