

2025 Seventh International Conference Neurotechnologies and Neurointerfaces (CNN 2025)

**Nizhny Novgorod, Russia
25-29 August 2025**



**IEEE Catalog Number: CFP25AU3-POD
ISBN: 979-8-3315-6896-2**

**Copyright © 2025 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:	CFP25AU3-POD
ISBN (Print-On-Demand):	979-8-3315-6896-2
ISBN (Online):	979-8-3315-6895-5

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

CONTENTS

Anderson Sarah, Eremenko Julia, Zinchenko Oksana, Shevtsov Oleg, Moiseeva Victoria, Shestakova Anna Automated Stimulus Delivery for Taste-Based Neuroimaging in Sensory and Consumer Neuroscience	5
Bolshakov Denis I., Mishchenko Mikhail A., Chindarev Daniil V., Matrosov Valery V. Deceleration the variables of the discrete recursive model of a neural-like generator to speed up and simplify calculations	8
Demareva Valeriia Stress Biomarkers for Applied Tasks: Analysis of Voice and Cardiac Signals	12
Diffine Ekaterina, Tiunova Anna, Puzik Matvey, Dzhivelikian Evgenii, Gershtein Joan, Anokhin Konstantin Hidden Markov Model analysis of structured dynamics and internal state transitions during visual category learning in biological neural systems	16
Gorodnicheva Julia, Bekim Amir, Klucharev Vasily, Monahhova Eliana, Mening Semyon, Morozova Alexandra, Zinchenko Oksana Uncertainty Reduction Through Affective and Cognitive Media Manipulations: An Eye-Tracking Pilot Study Across NFC Profile	20
Hai-Varonskaya D., Nezvinskiy A.A., Filyushkina V.I., Tomskiy A.A., Sedov A.S. Temporal parameters of extracellular potentials identify pallidal neuronal subtypes in patients with Parkinson’s disease	25
Ivanova Anna, Ivashkina Olga, Roshchina Marina, Toropova Ksenia, Anokhin Konstantin Modeling Associative Fear Learning with Multisensory Cues in Mice	28
Ivashkina Olga, Toropova Ksenia, Kriuchechnikova Anna, Rogozhnikova Olga, Zamorina Tatiana, Anokhin Konstantin Temporal Dynamics of Associative Contextual Fear Memories Storage in Mice	32
Kirasirova Luisa, Tugin Sergei, Pyatin Vasily, Salman Kabir Muhammad, Sagalajev Boriss Modality-Specific ERP Dynamics in Virtual and Non-Immersive Environments	36
Kondrakhin Pavel, Dubrovin Sergei, Salman Kabir Muhammad, Kolpakov Fedor, Sagalajev Boriss Ephaptic Coupling and Regular Firing Optimize Tactile Signal Transmission in the Dorsal Column	40
Kovaleva Natalia S., Mikhaylov Alexey, Guseinov Davud V., Mishchenko Mikhail A. Single neuron learns temporal pattern via memristive STDP with pulse-width modulation	44
Lobov Sergey A., Makarov Valeri A. Does spike firing rate dependence imply rate coding?	48
Lukov Mikhail, Blagovechtchenski Evgeny Changes in electrodermal activity during the performance of deep relaxation training	52
Makarova Anna, Soghoyan Gurgen, Sajfutdinov Timur, Dragoi Olga, Zuev Andrey, Karpov Oleg, Lebedev Mikhail StereoEEG Dynamics During Visual-Motor Interaction with a Robotic Hand	55
Matveeva Mariya, Mishchenko Mikhail, Shchanikov Sergey, Fedulina Anastasiya, Bolshakov Denis, Taran Denis, Kazantsev Victor, Mikhaylov Alexey Memristive network controls hippocampal CA1 area activity by adaptive close-loop stimulation	58
Mening Semyon, Fedele Tommaso, Otstavnov Nikita Working Memory: MEG Study Of The Oscillatory Mechanisms For Working Memory Components	62
Mitin Ilia V., Potapov Ivan A., Zharinov Alexey I., Lobov Sergey A., Kastalskiy Innokentiy A., Kazantsev Victor B. CPG-based neural control for a flapping-wing	66

ornithopter	
Momotenko Darya, Fedosov Nikita, Ossadtchi Alexei Travelling Waves Reconstruction Method with Monte Carlo Simulations based on MEG Data	70
Monakhova Eliana, Morozova Alexandra, Gorodnicheva Julia, Zinchenko Oksana, Mening Semen, Rudnenky Nikita, Klucharev Vasily Impact of Source Credibility on Medical Information Persuasiveness: A Pilot EEG Study	74
Morozova Alexandra, Monakhova Eliana, Gorodnicheva Julia, Zinchenko Oksana, Shestakova Anna, Klucharev Vasily Time-Frequency Representations in response to true and fake news: Pilot study	78
Nagornova Zhanna, Zavodova Ekaterina, Shemyakina Natalia Intersubject synchronization in the perception of a theatrical performance. Hyperscanning study	83
Okhalsnikov Alexandr, Motorina Anastasia, Ermoshina Anastasiia, Gavrish Maria Assessment of Mitochondrial Network Remodeling and Colocalization with Lysosomes in Primary Astrocyte Cultures from 5xFAD Mice	86
Pchelko Vasilii, Burundukov Pavel, Galchenko Maksim, Khanov Alexander, Timur Karimov Pavlovian Conditioning-Driven Three-Factor STDP-Inspired Learning in FitzHugh-Nagumo Spiking Neural Networks for Classification Tasks	90
Petukhov Alexandr Y., Morozov Nikita S., Krasnitskiy Nikolay V., Petukhov Yury V. Modeling of human cognitive activity under external information influence based on the mathematical apparatus of quantum mechanics	94
Plusnin Viktor, Ivanova Anna, Ivashkina Olga, Pospelov Nikita, Rogov George, Rogozhnikova Olga, Toropova Ksenia, Anokhin Konstantin Automated behavioral analysis tool for 3D-maze navigation tasks	99
Pospelov Nikita, Rogozhnikova Olga, Plusnin Viktor, Toropova Ksenia, Ivashkina Olga, Avetisov Vladik, Anokhin Konstantin Intrinsic dimensionality analysis of neuronal population activity	103
Pozniak L.A., Pultsina K.I., Ushakov V.L., Prokofyev A.O., Rytikova A.M., Chernyshev B.V. Effect of Associative Learning and Systems Consolidation on Theta Synchronization	107
Saenko Aleksandr, Tominov Roman, Vakulov Zakhar, Shikhovtsov Ivan, Parshina Natalia, Smirnov Vladimir Transparent zinc oxide memristive crossbar structures fabrication for robotic machine vision systems	110
Savelev Nikita, Ivashkina Olga, Pleskacheva Marina, Plusnin Viktor, Pospelov Nikita, Rogozhnikova Olga, Toropova Ksenia, Anokhin Konstantin Hippocampal spatial map represents the global structure of the environment rather than being aligned to local contrast cues	114
Savosenkov Andrey, Grigorev Nikita, Udoratina Anna, Ermolaev Denis, Bayova Larisa, Kandalov Igor, Gordleeva Susanna Temporal Dynamics of Event-Related Potentials in Visual Perceptual Decision-Making	118
Sayfulina Ksenia, Filyushkina Veronika, Belova Elena, Gamaleya Anna, Sedov Alexey Movement-related aperiodic activity of subthalamic nucleus in Parkinson's disease	121
Shemyakina Natalia, Nagornova Zhanna Can EEG of aesthetic reactions reveal who is in front of us, artist or non-artist?	123
Starodubtseva Nadezhda, Lebedev Mikhail Modulation of sensorimotor mu-rhythm during combined motor imagery and sustained muscle contraction	126
Tominov Roman, Vakulov Zakhar, Ugryumov Ivan, Popova Arina, Rodriguez Daniel, Smirnov Vladimir Synaptic plasticity of ZnO memristive structures for	130

neuromorphic systems of AI

Tsybina Yuliya, Gordleeva Susanna Astrocytes Stabilize Neural Simplices Against Noise in STDP-based Spiking Neural Networks	134
Vakulov Zakhar, Tominov Roman, Avilov Vadim, Fedotov Alexander, Shihovtsov Ivan, Smirnov Vladimir High-temperature annealing of ZnO:Ga nanocrystalline films for memristive crossbar structures	138
Vlasenko Daniil, Saranskaia Irina, Zakharov Denis From Pairwise to High-Order: Hypergraph Methods and Multivariate Connectivity Metrics for EEG/MEG	142
Zakharov Nikita, Belova Elena, Sedov Alexey Simulation of single-unit activity based on real data with preservation of temporal coordinates of bursts	146
Zharinov Alexey I., Potapov Ivan A., Mitin Iliya V. From neuron to motion: hybrid CPG-muscle modeling for biologically plausible robotics	149