

# **2022 III International Conference on Neural Networks and Neurotechnologies (NeuroNT 2022)**

**Saint Petersburg, Russia  
16 June 2022**



**IEEE Catalog Number: CFP22AN0-POD  
ISBN: 978-1-6654-6777-3**

**Copyright © 2022 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:	CFP22AN0-POD
ISBN (Print-On-Demand):	978-1-6654-6777-3
ISBN (Online):	978-1-6654-6776-6

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# CONTENT

## Section 1. Hybrid Intelligence Building Concepts

<i>Investigation of Local and Global Methods of Explainable Artificial Intelligence. Metrics for Evaluating Explanation Methods</i> Shevskaya N.V., Shishkin I.V., Stepanov V.D., Oblizanov A.D. ....	3
<i>Accelerating Neural Network Training Process on Multi-Core Machine Using OpenMP</i> Mohammed Omar T., Paznikov A.A., Gorlatch Sergei .....	7
<i>Socio-cultural, Socio-ethical and Economic-administrative Approaches to Classify Ethical Problems of Neural Networks</i> Pokrovskaja N.N. ....	12

## Section 2. Artificial Intelligence Technologies and Their Applications

<i>Russian Regions Scientific and Technical Security Indicators' Dynamics Neural Network Modeling</i> Mityakov E.S., Mityakov S.N., Shmeleva A.G., Ladynin A.I., Artemova S.V., Kamenskaia M.A. ....	16
<i>Neural Networks in Material Humidity Sensors</i> Artemova S.V., Kamenskaia M.A., Mityakov E.S., Chien Vu Chi, Ladynin A.I., Lapaev D.N. ....	20
<i>COVID-19 Screening Based on Application of Neural Network Classification of Exhale Spectra</i> Kugaevskikh A.V. ....	24
<i>Prediction of Next App in OS</i> Ma Ruimin, Zhang Yuyi, Liu Jing, Petrosian Ovanes, Krinkin Kirill .....	28
<i>Analysis of Multiplier Architectures for Neural Networks Hardware Implementation</i> Mironov S.E., Bureneva O.I., Milakin A.D. ....	32

## Section 3. Data Management and Organization of Computing in Intelligent Systems

<i>Neural Network Approach to the Electricity Market Forecasting with Different-frequency Data among the Explanatory Variables</i> Kosarev V.S. ....	36
<i>Correlation Discriminator of Signals in the Class of Fast Neural Networks</i> Dorogov A.Yu. ....	39
<i>Information Threat Recognition Method Using a Neural Network</i> Shichkina Y.A., Fatkueva R.R., Puzako I.A. ....	42
<i>Application of Recurrent Neural Networks with Controlled Elements for Accuracy Enhancement in Recognition of Sound Events in a Fog Computing Environment</i> Subbotin A.N., Zhukova N.A., Anaam Fahem.....	47
<i>Machine Methods of Tremorogram Analysis for Human Functional State Estimation</i> Safyannikov N.M., Bureneva O.I., Aleksanyan Z.A. ....	51
<i>Conceptual Model of an Information System for Collecting, Analyzing and Evaluating the Physical, Functional and Psychological State of a Person</i> Sergeev N.O., Shichkina Yu.A., Shevchenko V.I. ....	55