

**2023 XVIII International
Symposium Problems of
Redundancy in Information and
Control Systems
(REDUNDANCY 2023)**

**Moscow, Russia
24-27 October 2023**



**IEEE Catalog Number: CFP2371R-POD
ISBN: 979-8-3503-8153-5**

**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:	CFP2371R-POD
ISBN (Print-On-Demand):	979-8-3503-8153-5
ISBN (Online):	979-8-3503-8152-8
ISSN:	2377-6781

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

An Image Watermarking Algorithm in DCT Domain Based on Optimal Patterns	1
<i>Anna Melman, Oleg Evsutin, Danil Smirnov</i>	
Triple-Fault-Tolerant Binary MDS Array Codes with Lower Encoding Complexity.....	6
<i>Hanxu Hou, Linqi Song</i>	
On the MDS Condition of Generalized Expanded-Blaum-Roth Codes	12
<i>Hanxu Hou, Linqi Song</i>	
On the Classification of Completely Regular Codes with Covering Radius Two and Antipodal Dual	18
<i>Joaoim Borges, Dmitrii Zinoviev, Victor Zinoviev</i>	
Batch Version of Thompson Sampling in the One-Armed Bandit Problem	24
<i>Alexander Kolmogorov</i>	
Performance Assessment of an Early Preamble Collision Detection Approach for Cellular M2M Random Access	30
<i>Valentin Mikhailov, Nikita Stepanov, Andrey Turlikov</i>	
On Hadamard Matrices and Bent Functions.....	35
<i>Josep Rifà, Mercè Villanueva, Dimitrii Zinoviev, Victor A. Zinoviev</i>	
Neural Network Multipath Routing in Software Defined Networks Based on Artificial Bee Colony Algorithm	41
<i>Dmitry Perepelkin, Maria Ivanchikova, Tin Nguyen</i>	
Using of Transformer-Based Language Models to Separate Traffic Packets of Different Protocols.....	47
<i>Zalina Rusinova, Yury Chernyshov</i>	
Existence of Balanced Functions that Are Not Derivative of Bent Functions.....	51
<i>Vladimir N. Potapov</i>	
Perfect Bitrades in Johnson Graphs.....	54
<i>Ivan Mogilnykh, Konstantin Vorob'Ev</i>	
UCB Strategy for Batch Data Processing: Estimation of Variances at the Initial Stage.....	59
<i>Maxim Ershov, Albert Voroshilov</i>	
Method of Critical Set Construction for Successive Cancellation List Decoder of Polar Codes Based on Deep Learning of Neural Networks	64
<i>Feodosii Kotov, Fedor Ivanov, Ilya Timokhin</i>	
A Reaction Attack Against Cryptosystems Based on Quasi-Group MDPC Codes.....	70
<i>Kirill Vedenev, Yury Kosolapov</i>	
Machine Learning as a Communications Theory Problem.....	76
<i>Nikola Zlatanov</i>	
Completely Regular Codes as Optimal Structures	82
<i>Denis S. Krotov</i>	
Generalized Belief Propagation Decoding of Polar Codes.....	88
<i>Nikolai Iakuba, Peter Trifonov</i>	

Practical Vulnerabilities in Byzantine Fault-Tolerant Blockchain Consensus Protocols.....	94
<i>Bogdan Borzdov, Maxim Minchenok, Yury Yanovich</i>	
Infrastructure Security Checking Service Based on Chaos Engineering Method.....	100
<i>Sabina Belyaeva, Yury Yanovich</i>	
Stabilizing ALOHA Using Preamble-Based Exploration by Estimation of the Number of Active Users.....	106
<i>Artem Burkov, Roman Rachugin, Andrey Turlikov</i>	
Interleaving of Polymorphic Gabidulin Codes : Dedicated to the Memory of Ernst M. Gabidulin (1937–2021)	110
<i>Wenhui Li, Vladimir Sidorenko, Antonia Wachter-Zeh</i>	
Two-Level Index Modulation for Noncoherent Reception.....	116
<i>Polina V. Apalina, Alexander B. Sergienko</i>	
About the Joint Correcting of Error Bursts and Independent Errors Using LDPC Codes.....	122
<i>Alina Veresova, Andrei Ovchinnikov</i>	
Direct Optimization of Codebooks for Code-Domain Nonorthogonal Multiple Access with Noncoherent Reception	127
<i>Alexander B. Sergienko</i>	
Short Codes for ADMM-Based Decoding.....	133
<i>Dmitry Artemasov, Anna Fominykh, Alexey Frolov, Pavel Rybin, Kirill Andreev</i>	
Vulnerability Analysis of Azure Blockchain Workbench Key Management System	138
<i>Dmitry Tanana</i>	
Trapping and Absorbing Set Enumerators for Protograph-Based Generalized Low-Density Parity-Check Code Ensembles	142
<i>Emna Ben Yacoub</i>	
On the Error-Reducing Properties of Superposition Codes.....	148
<i>Kirill Andreev, Pavel Rybin, Alexey Frolov</i>	
Privacy-Preserving Blockchain-Based Tips Service.....	153
<i>Yash Madhwal, Evgeny Ovcharov, Yury Yanovich</i>	
On Strong Distance Invariance of Some Steiner Quadruple Systems	159
<i>Denis Krotov, Anastasia Vasil'Eva</i>	
Correcting Errors in Asymmetric and Generalized Asymmetric Channels with Feedback	163
<i>Ilya Vorobyev, Alexey Lebedev, Vladimir Lebedev</i>	
Codes for Memory Cells with Unreachable Levels.....	168
<i>Haider Al Kim, Vladimir Sidorenko</i>	
McEliece-Type Cryptosystem Based on Correction of Errors and Erasures	173
<i>Evgenii Krouk, Grigory Kabatiansky, Cedric Tavernier</i>	
Design of Non-Binary Polar Codes with Shaping	178
<i>Liudmila Karakchieva, Peter Trifonov</i>	
Impact of Proactive LEO Satellite Tracking on Heterogeneous IoRT Network Performance.....	183
<i>Alexander Kozlov, Mikhail Shapovalov, Alexey Rolich, Alexander Ilyin, Leonid Voskov</i>	

Data Compression Strategies for Enhancing IoRT Communications Over Heterogeneous Terrestrial-Satellite Networks	189
<i>Alexander Karnaukhov, Artem Idelevich, Alexey Rolich, Leonid Voskov</i>	
Method of Automatic Images Datasets Sampling for the Manual Operations Control Systems	194
<i>Anton Sergeev, Victor Minchenkov, Aleksei Soldatov, Sergey Lukashov, Yaroslav Mazikov</i>	
Subspace Mixed Dimension Codes Based on Gabidulin-Bossert Multicomponent Codes	200
<i>Nina Pilipchuk</i>	

Author Index