

2026 ElCon Conference of Young Researchers in Computing & Processing, and Information Security (ElCon-CP 2026)

**Saint Petersburg, Russia
3-5 February 2026**



**IEEE Catalog Number: CFP266BN-POD
ISBN: 979-8-3315-6266-3**

**Copyright © 2026 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:	CFP266BN-POD
ISBN (Print-On-Demand):	979-8-3315-6266-3
ISBN (Online):	979-8-3315-6265-6

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Contents

Preface	2
Section 1. Computing & Processing (Hardware/Software)	
Investigation of Image Reconstruction Methods for Real-Time Rendering Enhancement: A Case Study in Unity	4
<i>Belov Aleksandr V., Semichasnov Ilya V., Matanov Kirill A., Morozov Grigory S., Arkhipochkin Aleksandr S.</i>	
Development of a Database Structure for Constructing a Mathematical Model of a River Section Using Vector Geotaxon ..	11
<i>Chikin Andrey K., Alexeev Vladimir V.</i>	
Challenges in Designing Music Recommendation Systems	15
<i>Churilov Nikita S., Petrova Iana S.</i>	
Software Based on the Modernized Formant Method for Assessing Information Protection	20
<i>Denisov Vladislav D., Dushkin Alexandr V.</i>	
Digital Correction of Spatial–Spectral Aberrations in a Mobile Hyperspectral System	24
<i>Gonoshilkin Daniil Iu., Shatkovskaya Margarita S., Sokolov Nikita M., Sharivzyanov Dmitry R.</i>	
Software Development Using Transformer-Based LLMs	28
<i>Gorshkov Petr V.</i>	
Real-Time Route Planning in Disaster Evacuation using Real-Time Disaster Information	33
<i>Iakubchik Anna, Iakubchik Ian</i>	
Emotional Voice Reconstruction with Intonation Alteration and Language Model	36
<i>Iakubchik Ian, Iakubchik Anna</i>	
The Use of Virtual Reality for Training Automated Control System Operators on Digital Twins	42
<i>Inozemtseva Margarita V., Serebryakov Mikhail Y.</i>	
Fixed-Point Implementation of the LMS Adaptive Algorithm on FPGA for Digital Phased Array Signal Processing	47
<i>Kaleev Dmitrii, Turintsev Kirill</i>	
Machine Learning and Deep Learning for Brain Tumor Detection	52
<i>Karaja Nahida, Zhukova Nataly A., Nizamli Yasser, Mreish Kinda, Zakzouk Shaimaa</i>	
Environmental Deviation Detection Using Intelligent Agents	56
<i>Khassanov Akmal M.</i>	
Fuzzy-Wiener Graph Framework for Heart Disease Classification	60
<i>Khin Khin Lay, Nay Lynn, Aung Zaw Mying</i>	
Calibration of an Omnidirectional Vision System and Obstacle Distance Measurements	65
<i>Kholodilin Ivan Yu., Kuznetsova Yuiya S., Saranceva Kristina M., Egorova Ksenia A., Zhou Tao, Zhang Zihan</i>	
Neural Network Training Methodology for Semantic Segmentation of Maps in Navigation Tasks	70
<i>Kovalev Vladimir, Salamakhin Anton, Ilatovskaya Ekaterina, Fedorkova Anastasia, Filatov Denis</i>	
Comparison of Classical Methods and Neural Networks for Detecting Anomalies in Industrial Sensor Data	76
<i>Kraeva Daria A., Kainova Tatiana D.</i>	
Impact of Numerical Integration Methods on Spike Generation in Izhikevich Neuron Model	80
<i>Kurtova Karina, Khanov Alexander, Vasilchenko Oleg, Skliar Egor, Mikhailov Alexander</i>	
Sorting Algorithm Performance Under Varying Data Conditions	85
<i>Kustov Maxim</i>	
Golang Scheduler	88
<i>Levchuk Egor, Pushkar Denis, Vasin Denis</i>	
Numerical Simulation of General Methods of Electric Heating in Industry	94
<i>Pirozhkov Maksim I., Bychkov Sergey A.</i>	

Hyperspectral Imaging for Physiological Indices: Saving Bands, Maintaining Accuracy	99
<i>Shatkovskaya Margarita S., Gonoshilkin Daniil Iu., Sokolov Nikita M., Sharivzyanov Dmitry R.</i>	
Detection and Recognition of Multilingual Textual Information from Road Traffic Panels using Advanced Deep Learning Models	105
<i>Syed Hassaan Ali Shah, Ali Muqarab Awan, Aitzaz Ahmed, Jawaria Maqbool</i>	
Models and Algorithms for Applying Artificial Intelligence to Manage the Quality of Electronic and Software Component Supply Chains	111
<i>Tarasevich Olga A., Yaschenko Vladimir V.</i>	
Analysis of Approaches to Executing Fuzzy Queries to Relational Databases	119
<i>Tran Duc Manh</i>	
Communication Optimization Techniques for Distributed Synchronous Data Parallel Training	124
<i>Vlasova Elvira A., Nemytykh Polina K.</i>	
Face Recognition Based Attendance System Using Python & Flask	131
<i>Zin Phy Aung, Yakunin Alexey N., Soe Moe Htet, Aung Myo Naing</i>	
Deep Anomaly Detection in Unstructured System Log Files with Ensemble-Based Learning	134
<i>Zuev Mikhail E., Semidolin Atryom D.</i>	
Teachers' and Students' Perceptions of the Role of AI Tutors in Engineering Study Programs	139
<i>Chebotarev Egor A., Shaposhnikov Sergey O.</i>	
Section 2. Information Security	
Mitigation of DDoS Attacks in Software-Defined Networks Using Machine Learning	143 140
<i>Abdullah Al Kanj, Fedorchenko Elena</i>	
Architecture and Power-Balancing Effects on Side-Channel Leakage Protection in AES Hardware Implementations .	148 145
<i>Alekseev Valery D., Tishin Alexander S., Mikhailov Victor Y.</i>	
Adversarial Verification of the Machine Learning Models Security	154 151
<i>Guseva Maria E., Kalinin Maxim O.</i>	
Information Security Technical Means Characteristics Assessment Methodic	161 158
<i>Ladynin Andrey I., Shmeleva Nina M.</i>	
Investigation of Fault Tolerance and Security in Microservice Architecture through Mathematical Modeling Methods	165 162
<i>Litvinova Karina V., Mailybayev Yersaiyn K., Jumabekova Dariya A., Yegetayev Zangar S., Kaliulla Daulet M., Amanova Raihan T.</i>	
Measurement Techniques for Power Analysis in Side-Channel Attacks on Integrated Circuits	170 167
<i>Mikhailov Victor Y., Tishin Alexander S., Alekseev Valery D.</i>	
Sat-Based Model for Verifying Access Policies with Graph Zone Decomposition in Critical Information Infrastructure Networks	174 171
<i>Musin Damir R., Dushkin Alexandr V.</i>	
Comprehensive Security for Smart City Blockchain Infrastructures through Advanced Consortium-Based Transaction Verification.....	179 176
<i>Okhlopkov Nikita M., Kalinin Maxim O.</i>	
Quantum-Resistant Registration for Federated Messaging Systems with Shamir's Secret Sharing	185 182
<i>Osipova Ekaterina V., Butakova Natalia G.</i>	
A Comparative Analysis of Edge and Cloud Architectures for Real-Time Industrial Control Systems	189 186
<i>Silantiev Maxim S., Minin Maxim S.</i>	
Security Analysis of the Session Initiation Protocol (SIP): Vulnerability Assessment and Threat Modeling	193 190
<i>Smirnov Yaroslav V., Nikiforova Anna V.</i>	
Review of Cyber Security Challenges & Solutions in Cloud Networks	197 194
<i>Tarish Hiba A., Mohammed Q. Mohammed</i>	

Deterministic Model for Assessing the Probability of Cyber-Attack Scenarios Against Artificial Intelligence Systems 202 199
Tatarchuk Mikhail D., Dushkin Alexandr V.

Recommendations for Using Blockchain Technology to Protect the Personal Data of Web Service Users 206 203
Tomchuk Dmitry E.

Section 3. Components, Circuits, Devices & Systems

Development of an optical Diffraction System for Detecting Defects on the Surface of a Railway Wheel
During Movement 210 207
Arinushkina Kseniya G., Tsomaev Pavel I.

Simplified Geometric Inverse Kinematic Approach for Collaborative Robot 215 212
*Kholodilin Ivan Yu., Kuznetsova Yuiya S., Saranceva Kristina M., Egorova Ksenia A., Filimonova Veronika A.,
Rzhavtsev Leonid A.*

S3-FIFO Cache for LSM-based Key-value Stores 220 217
Khramov Ivan, Komarov Timofey, Aladin Aleksandr, Balashova Ekaterina

The «SmartResort» Intelligent System Development for Selecting the Sanatorium Based on Smart Metadata 224 221
Kovaleva Angelika O., Baryshnikov Andrey A., Martirosyan Karina V., Myasnikova Elena V.

Design and Implementation of an Autonomous Neural Network Subsystem for Monitoring Computer Systems Digital
Components 228 225
Krutikov Alexander K., Strabykin Dmitry A., Meltsov Vasily Yu., Golovin Aleksei A.

Development of a System for Detecting Defects in Power Transmission Poles 234 231
Loginov Nikita A., Martirosyan Alexander V., Shaltumaev Timur Sh.

Modeling of Ventilation and Air Conditioning Control Systems for Processing Plants 239 236
Musta Ludmila G., Kozhubaev Yriy K., Lozhkina Valeria O., Yin Changwen, Ali Abbas

Modeling of Control and Monitoring Systems for Positioning Workers in a Coal Mine 245 242
Musta Ludmila G., Kozhubaev Yriy K., Gerasimova Valeria V., Yin Changwen, Shbib Hassan

Sensory Integrate-and-Fire Neuron Model with Volatile Memristor Emulator 251 248
Pchelko Vasiliy, Petukhova Elizaveta, Kalinina Anastasia, Samsonik Kirill, Mikhailov Alexander, Kurtova Karina

Comparison of GPU, FPGA, and VPU Hardware Accelerators for Edge AI Tasks in Cyber-Physical Systems 255 252
Stetsenko Alexander A., Tsareva Polina E.

Author Index