2016 IEEE First International Conference on Data Stream Mining & Processing (DSMP 2016)

Lviv, Ukraine 23-27 August 2016



IEEE Catalog Number: ISBN:

CFP16J13-POD 978-1-5090-3737-7

Copyright © 2016 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP16J13-POD

 ISBN (Print-On-Demand):
 978-1-5090-3737-7

 ISBN (Online):
 978-1-5090-3736-0

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



Table of Contents

Session A. Hybrid Systems of Computational Intelligence	1
A Loosely-Integrated Suite of Services for mHealth Formed by Wireless Sensor Networks. Oleksiy O. Petrenko, Anatoly I. Petrenko, Ukraine	N/A
The Fully-Defined Neuro-Fuzzy Model Synthesis. <i>Sergey Subbotin, Andrii Oliinyk</i> , Ukraine	N/A
Evaluation of Testing Assignment for System Level Self-Diagnosis. <i>Viktor Mashkov, Jiří Fišer,</i> Czech Republic, <i>Volodymyr Lytvynenko</i> , Ukraine	15
Inductive Model of Data Clustering based on the Agglomerative Hierarchical Algorithm. <i>Sergii Babichev</i> , Czech Republic, <i>Mohamed Ali Taif</i> , <i>Volodymyr Lytvynenko</i> , Ukraine	19
The Development of Hybrid Intelligent Systems on the Basis of Neurophysiological Methods and Methods of Multi-Agent Systems <i>Sergei Koryagin, Pavel Klachek, Evgenei Koryagin, Aleksandr Kulakov</i> , Russian Federation	23
Product-Resource Planning System. <i>Oleksii Iegorchenkov, Nataliia Yehorchenkova</i> , Ukraine	29
Neo-Fuzzy Approach for Medical Diagnostics Tasks in Online-Mode. <i>Iryna Perova, Iryna Pliss, Gennadiy Churyumov, Franklin M. Eze,</i> Ukraine, <i>Samer Mohamed Kanaan Mahmoud</i> , Kingdom of Saudi Arabia	34
Soft-Computing Techniques for Mobile Networks. <i>Olena Semenova, Lidiya Rogozina,</i> Ukraine	N/A
Fuzzy Logic Inference for Unsupervised Anomaly Detection. <i>Tetiana Gladkykh, Taras Hnot, Volodymyr Solskyy,</i> Ukraine	42
Intellectual Approach Application for Pulmonary Diagnosis. <i>Natalya O. Komleva, Kyrylo S.Cherneha, Borys I. Tymchenko, Oleksandr M. Komlevoy,</i> Ukraine	48
Evaluation of Competing Agents Based on Neuro-Evolutionary Approach. <i>Tetiana Kolpakova, Andrii Oliinyk, Valerii Lovkin,</i> Ukraine	N/A
The Forecasting of Future Changes in the Trend's Direction of Stock Quotes by Neural Networks and Fuzzy Systems. <i>Ireen O. Kravets, Victoria O. Kozlovskaya, Volodymyr S. Tumko,</i> Ukraine	57
The Analysis of Uncertainty Measures with Various Types of Evidence. <i>Alyona Shved, Yevhen Davydenko</i> , Ukraine	61
Development of Conceptual Approach to Development of Complex Systems Analysis Model. <i>Vitaliy Omelyanenko</i> , Ukraine	N/A

System of Computational Linguistic on Base of the Figurative Text Comprehension. Oleg Bisikalo, Anna Lisovenko, Olexandr Jahumovuch, Sergii Trachenko, Mykola Pradivliannyi, Ukraine	69
Wavelet Technologies of Non-stationary Signals Analysis. <i>Valeriy Dubrovin, Mariia Zakharova, Julia Tverdohleb,</i> Ukraine	N/A
New Design of Reversible/Quantum Devices for Ternary Arithmetic. <i>Zhengbing Hu</i> , China, <i>Vitaly Deibuk</i> , Ukraine	80
Information Management Technology by Non-Forceful Influence on the Enemy During the Preparation and Conduction of Military Actions. <i>Yurii N. Teslia, Mykola B. Kubiavka, Liubov B. Kubiavka</i> , Ukraine	85
Synthesis and Research of Neuro-Fuzzy Observer of Clamping Force for Mobile Robot Automatic Control System. <i>Yuriy P. Kondratenko</i> , USA, <i>Oleksiy V. Kozlov, Oleksandr S. Gerasin, Yuriy M. Zaporozhets</i> , Ukraine	90
Optimization of the Parameters of the Layer System on the Example of the Optical Structure. Oleksandr Mitsa, Vasil Petcko, Jozsef Holovács, Oleksandr Levchuk, Ukraine	N/A
Accelerating Recurrent Neural Network Training using Sequence Bucketing and Multi-GPU Data Parallelization. <i>Viacheslav Khomenko, Oleg Shyshkov, Olga Radyvonenko, Kostiantyn Bokhan,</i> Ukraine	100
A Fast Learning Algorithm of Self-Learning Spiking Neural Network. <i>Yevgeniy Bodyanskiy, Artem Dolotov, Iryna Pliss, Mykola Malyar,</i> Ukraine	104
Mathematical Modeling of Heat and Moisture Transfer and Reological Behavior in Materials with Fractal Structure Using the Parallelization of Predictor-Corrector Numerical Method. Yaroslav Sokolovskyy, Volodymyr Shymanskyi, Mar'iana Levkovych, Volodymyr Yarkun, Ukraine	108
Invariant Operations on Discrete Neural Functions over Galois Field. Fedir E. Geche, Anatolii Ye. Batyuk, V.Yu. Buchok, Ukraine	112
Intelligent Analysis of Multiparameter Data based on the Adaptive Neuro-Fuzzy System. <i>Lidiia I.Feshanych, Georgij N.Sementsov,</i> Ukraine	N/A
Graphical Interface of Hybrid Intelligent Systems for Biomedical Imaging Analysis. Yuriy Batko, Grygoriy Melnyk, Oleg Pitsun, Ukraine	121
Criteria Synthesis Problem for the Chaotic Systems Identification. <i>Anton I. Guda, Aleksandr I. Mikhalyov,</i> Ukraine	125
The Method of Encryption based on Ateb-Functions. Mariya Nazarkevych, Roman Oliiarnyk, Hanna Nazarkevych, Olga Kramarenko, Igor Onyshschenko, Ukraine	129
Recovery Schemes for Distributed Computing Based on BIB-Schemes. <i>Oleg Riznyk, Yurii Kynash, Oleksandr Povshuk, Volodymyr Kovalyk,</i> Ukraine	134
Neural Network Approach in the Stroke Diagnosis. Leonid Kupershtein, Tetyana Martyniuk, Olesya Voitovych, Mihail Krentsin, Ukraine	138

Use of Taylor Polynomial for Numerical Integration of Table Functions of Two Variables. <i>Yurij Gryciuk, Yaroslav Dragan,</i> Ukraine	N/A
Portfolio Project Selection as Information Processing System. <i>Rekik Ali, Temani Moncef, Ghedira Khaled</i> , Tunis	N/A
Assessment of Damage to Buildings in Areasemergency Situations. <i>Anatoliy Kovalchuk, Natalia Lotoshynska</i> , Ukraine	152
Session B. Machine Vision and Pattern Recognition	157
Design and Implementation of Visitors Queue Density Analysis and Registration Method for Retail Videosurveillance Purposes. <i>Dmytro Peleshko, Yuriy Ivanov, Boris Sharov, Ivan Izonin, Yuriy Borzov,</i> Ukraine	159
Tracking in the Intersection Areas of the Cameras Fields-of-View of CCTV Monitoring Distributed Systems. <i>Yuriy Rashkevych, Dmytro Peleshko, Yuriy Ivanov, Igor Malets, Viktor Voloshyn,</i> Ukraine	163
Neocognitron as a Tool for Optical Marks Recognition. <i>Oleksii Gorokhovatskyi</i> , Ukraine	169
Correlation-Extreme Method for Text Area Localization on Images. <i>Tien Nguyen, Svitlana Antoshchuk, Anatolii Nikolenko, Viktor Sotov,</i> Ukraine	173
Development of Double Median Filter for Optical Navigation Problems. <i>Maksym P. Musiyenko, Oleksii O. Denysov, Iryna M. Zhuravska, Ivan S. Burlachenko,</i> Ukraine	177
Face Classification by Graph Decomposition Algorithm for Parametric Statistical Features. <i>Roman Melnyk, Yuriy Kalychak,</i> Ukraine	182
Shadow Detection and Removal Using a Shadow Formation Model. <i>Yana I. Shedlovska, Volodymyr V. Hnatushenko,</i> Ukraine	187
Features of the Segmentation and Classification of Urban Area Photogrammetric Images. <i>Alexander A. Safarov</i> , Ukraine	191
Lossless Image Compression in the Remote Sensing Applications. <i>Bogdan Rusyn, Oleksiy Lutsyk, Yuriy Lysak, Adolf Lukenyuk, Lubomyk Pohreliuk,</i> Ukraine	195
Deep Convolutional Network for Detecting Probable Emergency Situations. <i>Oleksii Maksymiv, Taras Rak, Olga Menshikova</i> , Ukraine	199
Automatic Image Contrast Enhancement Based on the Generalized Contrast. <i>Elena Yelmanova</i> , Ukraine	203
Representation and Identification of Lines by Dots in the Image. <i>Ihor Shelevytsky, Evgeny Tkachenko,</i> Ukraine	N/A
Fréchet Metric for Trees. Oleh Berezsky, Ukraine	213
The Wavelet Based Trained Filter for Image Interpolation. <i>Adrian Nakonechny, Zenoviv Veres,</i> Ukraine	218

Video De-Noising Using Adaptive Wavelet Thresholding. <i>Volodymyr Fedak, Adrian Nackonechny,</i> Ukraine	N/A
Designing of Recognition Systems for Discrete Objects. Igor Povhan, Ukraine	N/A
A Digital Watermarking Scheme Based on Autoassociative Neural Networks of the Geometric Transformations Model. <i>Yurii Tsymbal, Roman Tkachenko,</i> Ukraine	231
Two-Frames Image Superresolution based on the Aggregate Divergence Matrix. Dmytro Peleshko, Taras Rak, Marta Peleshko, Ivan Izonin, Danylo Batyuk, Ukraine	235
Sequential Temporal Video Segmentation via Spatial Image Partitions. <i>Sergii Mashtalir, Volodymyr Mashtalir,</i> Ukraine	239
The Methods of Image Segmentation Based on Distributions and Wavelet Transform. Marina Polyakova, Victor Krylov, Natalya Volkova, Ukraine	243
Analysis of Threats Falsification of Printed Documents. Oksana Troyan, Maksym Korobchynskyi, Oleksii Didyk, Ukraine	248
Session C. Dynamic Data Mining & Data Stream Mining	255
Fast Learning Algorithm for Deep Evolving GMDH-SVM Neural Network in Data Stream Mining Tasks. <i>Yevgeniy Bodyanskiy, Olena Vynokurova, Iryna Pliss, Galina Setlak, Pavlo Mulesa,</i> Ukraine	257
Adaptive Robust Models for Identification of Nonstationary Systems in Data Stream Mining Tasks. Yevgeniy Bodyanskiy, Olena Vynokurova, Zdzisław Szymański, Ilya Kobylin, Oleg Kobylin, Ukraine	263
Distance Learning Method for Modern Youth Promotion and Involvement in Independent Scientific Researches. Vasyl Lytvyn, Victoria Vysotska, Liliya Chyrun, Lyubomyr Chyrun, Ukraine	269
A Spectral Method of Jitter Estimation in Telecommunication Networks. <i>Gennadiy</i>	N/A
Bortnyk, Mikola Vasylkivskyi, Ukraine Real Time Recursive Preference Learning to Rank from Data Stream. <i>Leonid</i> Lyubchyk, Galyna Grinberg, Ukraine	280
An Application of Multifractal Analysis to Photogrammetric Image Segmentation. <i>Olga V. Spirintseva</i> , Ukraine	286
Models of Combining Measuring and Information Systems for Evaluation Condition Parameters of Energy-Active Systems. <i>Lubomyr Sikora, Natalya Lysa, Roman Martsyshyn, Yuliya Miyushkovych,</i> Ukraine	290
Change-Point Detection During Radar Operation. Olexander Solomentsev, Maksym Zaliskyi, Tetyana Gerasymenko, Ukraine	295
Multipitch Estimation Using Multiple Transformation Analysis. <i>Krzysztof Rychlicki-</i> <i>Kicior, Bartłomiej Stasiak, Mykhaylo Yatsymirskyy</i> , Poland	299

Investigation of Multifractal Properties of Additive Data Stream. <i>Igor Ivanisenko, Lyudmyla Kirichenko, Tamara Radivilova,</i> Ukraine	305
Data Streams Fast EM-Fuzzy Clustering based on Kohonen's Self-Learning. Yevgeniy V. Bodyanskiy, Anastasiia O. Deineko, Yana V. Kutsenko, Oleksandr O. Zayika, Ukraine	309
Processing and Analysis of Rhinomanometric Signals by F-transform Approximation. Andriy Yerokhin, Alina Nechyporenko, Andrii Babii, Oleksii Turuta, Ukraine	314
A Deep Cascade Neuro-Fuzzy System for High-Dimensional Online Fuzzy Clustering. Zhengbing Hu, China, Yevgeniy V. Bodyanskiy, Oleksii K. Tyshchenko, Ukraine	318
Forecasting Method based on the Joint Use of Regression Analysis and Bayesian Networks. <i>Petro Bidyuk, Aleksandr Gozhyj, Irina Kalinina, Victor Gozhyj</i> , Ukraine	N/A
Emotion Recognition Using Sigma-Pi Neural Network. Nonna Kulishova, Ukraine	327
Designing Features of Hardware and Software Tools for Intelligent Processing of Intensive Data Streams. <i>Ivan Tsmots, Oleksa Skorokhoda, Taras Tesliuk, Vasyl Rabyk,</i> Ukraine	332
Identification and Modeling of Limiting Factors Systems. <i>Roman Pasichnyk, Mykola Dyvak, Nataliia Pasichnyk,</i> Ukraine	336
Information Technology Components Selecting for Equipment Critical Applications. Galina Shcherbakova, Victor Krylov, Radmila Pisarenko, Ukraine	341
Apache Storm Based on Topology for Real-Time Processing of Streaming Data from Social Networks. <i>Anatoliy Batyuk, Volodymyr Voityshyn,</i> Ukraine	345
Hybrid Searching GMDH-GA Algorithm for Solving Inductive Modeling Tasks. Volodymyr Stepashko, Olha Moroz, Ukraine	350
Modeling of Solar Energy Potential in Libya using an Artificial Neural Network Model. Hakan Kutucu, Ayad Almryad, Turkey	356
Session D. Big Data & Data Science Using Intelligent Approaches	361
Artificial Intelligence Methods for Data based Modeling and Analysis of Complex Processes: Real Life Examples. <i>Kristina Vassiljeva, Eduard Petlenkov, Vitali Vansovits, Aleksei Tepljakov</i> , Estonia	363
Investigation of Sensitivity Impact of Receiver to Effective Data Transmission Rate. Dmytro V. Mykhalevskiy, Ukraine	N/A
The Classification Algorithm Development of Photomasks Defects Based on Fuzzy Logic. <i>Yuliya Kozina, Nataliya Gulyaeva</i> , Ukraine	373
Linear, Machine Learning and Probabilistic Approaches for Time Series Analysis. Bohdan M. Pavlyshenko, Ukraine	377

Big Data in Information Analytical System «NEWSCAPE». <i>Leonid Hulianytskyi, Sergiy Malyshko,</i> Ukraine	N/A
Control of Informational Impacts on Project Management. <i>Yurii Teslia, Andrii Khlevnyi, Iulia Khlevna, Svetlana Gerasymenko,</i> Ukraine	387
A Multifaceted Approach to Smart Energy City Concept through Using Big Data Analytics. <i>Vasylyna Horban,</i> Ukraine	392
Information Protection of Data Processing Center Against Cyber Attacks. <i>Ogbu James Onyigwang, Yanina Shestak, Alexandr Oksiuk,</i> Ukraine	397
Synthesis and Optimization of Error Correcting Code Based on Ideal Ring Bundles in Big Data Tasks. <i>Daniel Skrybailo-Leskiv</i> , Ukraine	N/A
Strategic Gaps in the Capabilities of Internal and External Adaptation of Methodologies and Information Systems of Project Management. <i>Viktor V. Morozov, Alexander G. Timinsky,</i> Ukraine	405
Panel Sessions	411
Panel 1. Challenges of Execution and Implementation of Machine Learning Projects for SMEs. <i>Michael Dopira</i> , Ukraine	413
Panel 2. Essential Data Engineering for Data Scientist. Valentyn Kropov, Ukraine	413
Panel 3. How Data Science and Big Data Are Changing the World. <i>Alexander Sokolov</i> , Ukraine	414
Panel 4. Unsupervised Anomaly Detection for Information Security. <i>Tetiana Gladkykh, Taras Hnot, Volodymyr Solskyy</i> , Ukraine	415
Panel 5. Data Science Education in Ukraine: Opportunities and Market Demand Yaroslav Prytula, Zenoviy Veres, Yuriy Guts, Viktor Sarapin, Vladislav Alekseyev, Ukraine	416
Panel 6. Internal GlobalLogic Data Processing Solutions. <i>Tymur Biktashev, Dmytro Yerusalimtsev, Sergiy Podnos, Igor Manzhos, Irina Kartyshova</i> , Ukraine	417
Panel 7. Stefan Banach and Lviv Mathematical School. Yaroslav Prytula, Ukraine	418
Panel 8. Big Data in Cloud. Margaret Ostapchuk, Ukraine	418

Author's Index