

**2016 XIth International Scientific  
and Technical Conference  
"Computer Sciences and  
Information Technologies"  
(CSIT 2016)**

**Lviv, Ukraine  
6 – 10 September 2016**



**IEEE Catalog Number: CFP16D36-POD  
ISBN: 978-1-5090-2741-5**

**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:	CFP16D36-POD
ISBN (Print-On-Demand):	978-1-5090-2741-5
ISBN (Online):	978-1-5090-2740-8

**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

## CONTENTS

<b>1. An Improved CPSO Algorithm .....</b>	<b>1</b>
Bożena Borowska	
<b>2. Multicriteria Architecture Choice of Software System Under Design and Reengineering .....</b>	<b>4</b>
Alexander Kharchenko, Irina Halay, Ihor Bodnarchuk	
<b>3. Digital Video Watermarking Scheme Based On IDR Frames Using MPEG Structure.....</b>	<b>PIC</b>
Sarabjeet Singh, Rakesh Ahuja	
<b>4. Methods of Real-time Detecting Manipulation in Online Communities .....</b>	<b>15</b>
Andrij Peleschyshyn, Zoriana Holub, Ivanna Holub	
<b>5. Development of a Regional Energy Efficiency Control System on the Basis of Intelligent Components .....</b>	<b>18</b>
Mykola Medykovskyy, Ivan Tsmots, Yurii Tsymbal, Anastasia Doroshenko	
<b>6. An approach to Software Defined Cloud Infrastructure management.....</b>	<b>21</b>
Sergii Telenyk, Eduard Zharikov, Oleksandr Rolik	
<b>7. Implementation of Image Processing Algorithms Based on GPU .....</b>	<b>27</b>
Ivan Tsmots, Oleh Berezkyi, Ihor Ihnatiev, Iryna Gumovska	
<b>8. Data Protection Based on Encryption Using Ateb-functions .....</b>	<b>30</b>
Mariya Nazarkevych, Oksana Troyan, Roman Oliarnyk, Hanna Nazarkevych	
<b>9. Regions Matching Algorithms Analysis to Quantify the Image Segmentation Results .....</b>	<b>33</b>
Oleh Berezsky, Grygoriy Melnyk, Yuriy Batko, Oleh Pitsun	
<b>10. Economic Evaluation and Government Regulation of Technogenic (Man-made) Damage in the National Economy .....</b>	<b>37</b>
Oleh Kuzmin, Myroslava Bublyk	
<b>11. Implementation of the Information System of the Association Rules Generation from OLAP-cubes in the Post-relational DBMS Caché.....</b>	<b>40</b>
Mykola Fisun, Hlib Horban	
<b>12. Analysis of Modeling Methods and Tools of Complex Computer Systems and Information Technologies .....</b>	<b>45</b>
Volodymyr Ovsyak, Oleksandr Ovsyak, Julia Petruszka	
<b>13. Fuzzy Extreme Control and Electric Mode Coordinates Stabilization of Arc Steel-melting Furnace .....</b>	<b>49</b>
Orest Lozynskiy, Andriy Lozynskiy, Yaroslav Paranchuk, Roman Paranchuk, Igor Holovach, Volodymyr Tsyapa	
<b>14. Computing of Hands Gestures' Informative Video Features.....</b>	<b>55</b>
Saule Kudubayeva, Dmitriy Ryumin, Ainur Sndetbayeva, Yuri Krak	
<b>15. Semantic Approach to Personalization of Medical Data .....</b>	<b>59</b>
Natalia Melnykova, Oksana Markiv	
<b>16. A Multicore Accelerated Implementation for Statistical Analysis of Facial Expressions in Video .....</b>	<b>62</b>
Sumeyye Bayrakdar, Ibrahim Yucedag, Devrim Akgun	

<b>17. Delay Characteristics of TDMA Medium Access Control Protocol for Cognitive Radio Networks .....</b>	<b>66</b>
Muhammed Enes Bayrakdar, Ali Çalhan	
<b>18. Usage of Phase Space Diagram to Finding Significant Features of Rhinomanometric Signals .....</b>	<b>70</b>
Andriy Yerokhin, Oleksii Turuta, Andrii Babii, Alina Nechyporenko, Ihor Mahdalina	
<b>19. Determination of Development Scenarios of the Educational Web Forum .....</b>	<b>73</b>
Yuriy Syerov, Solomia Fedushko, Zoriana Loboda	
<b>20. Principles of University’s Information Image Protection from Aggression .....</b>	<b>77</b>
Roman Korzh, Andriy Peleshchysyn, Yuriy Syerov, Solomia Fedushko	
<b>21. Evaluation of Mutual Influences of Software Quality Characteristics Based ISO 25010:2011 .....</b>	<b>80</b>
Tetiana Hovorushchenko, Oksana Pomorova	
<b>22. On the Temporal Access Control Implementation at the Logical Level of Relational Databases .....</b>	<b>84</b>
Pavlo Zhezhnych, Teodor Burak, Oleg Chyrka	
<b>23. Use of Electric and Acoustic Technologies for Automated Control of Liquid.....</b>	<b>88</b>
Maryna Mikhalieva, Mykola Mykyychuk, Nataliya Hots, Yuliia Dzikovska	
<b>24. Mathematical Modeling of Non-Isothermal Moisture Transfer and Visco-Elastic Deformation in the Materials with Fractal Structure .....</b>	<b>91</b>
Yaroslav Sokolovskyy, Volodymyr Shymanskyi, Mar’iana Levkovich	
<b>25. Ateb-prediction Simulation of Traffic Using OMNeT++ Modeling Tools .....</b>	<b>96</b>
Ivanna Dronyuk, Olga Fedevych, Piotr Lipinski	
<b>26. The Fundamentals of Communities Creation and Development in the Social Environment of the Internet .....</b>	<b>99</b>
Yuriy Forkun, Andriy Peleschysyn	
<b>27. The structure of Information Systems for Environmental Monitoring .....</b>	<b>102</b>
Natalya Shakhovska, Oleksii Shamuratov	
<b>28. Functional-network Model of Tasks Performance of the Virtual Communities Life Cycle Directions .....</b>	<b>108</b>
Olga Trach, Andriy Peleshchysyn	
<b>29. Information Support for Brownfield Revitalization Projects .....</b>	<b>111</b>
Roman Danel Ostrava, Zdeněk Neustupa	
<b>30. The problem-based learning in Electrical engineering .....</b>	<b>116</b>
Vasyl Korud, Serhiy Rendzinyak, Orest Hamola	
<b>31. A Cascade Deep Neuro-Fuzzy System for High-Dimensional Online Possibilistic Fuzzy Clustering .....</b>	<b>119</b>
Zhengbing Hu Wuhan, Yevgeniy Bodyanskiy, Oleksii Tyshchenko	
<b>32. Intelligent Real Time Videosystems of New Generation.....</b>	<b>123</b>
Vitaliy Boyun	
<b>33. Multidimensional Signals and Cyclic Codes over Torus Geometry .....</b>	<b>126</b>
Volodymyr Riznyk	
<b>34. Specifics of Phonostatistical Structure of the Scientific Style in English Style System .....</b>	<b>129</b>
Iryna Khomytska, Vasyl Teslyuk	

<b>35. Statistical Methods to Detect Gender Peculiarities of Communication in Vkontakte Social Network Groups .....</b>	<b>132</b>
Yan Butelsky	
<b>36. Optimal Aggregation Models for the Problem of Minimizing the Total Expenses of Multiproduct Production .....</b>	<b>136</b>
Taisa Borovska	
<b>37. Semi-Structured Data Dynamic Integration Mashup System.....</b>	<b>140</b>
Irina Kushniretska	
<b>38. Features of E-Learning Realization Using Virtual Research Laboratory .....</b>	<b>143</b>
Nataliya Shakhovska, Victoria Vysotska, Lyubomyr Chyrun	
<b>39. Computational Problems in Automatized Reliability Analysis based on Fault Tree .....</b>	<b>149</b>
Tetyana Stefanovych, Serhiy Shcherbovskykh	
<b>40. The Formalization of Complex Operations on the Temporal Characteristics of Objects under Uncertainty .....</b>	<b>152</b>
Victor A. Krisilov, Katherine Gorodnichaya	
<b>41. Structure and Software Model of a Parallel-Vertical Multi-Input Adder for FPGA Implementation .....</b>	<b>158</b>
Ivan Tsmots, Oleksa Skorokhoda, Vasyl Rabyk	
<b>42. Fault-Tolerance Improvement for Core and Edge of IP Network .....</b>	<b>161</b>
Oleksandr Lemeshko, Oleksandra Yeremenko, Nadia Tariki, Ahmad M. Hailan	
<b>43. Algebraic Model for Knowledge Representation in Situational Awareness Systems .....</b>	<b>165</b>
Khrystyna Mykich, Yevhen Burov	
<b>44. A Review of Agile Practices for Project Management .....</b>	<b>168</b>
Vira Liubchenko	
<b>45. Linguistic Models of Assistive Computer Technologies for Cognition and Communication.....</b>	<b>171</b>
Maksym Davydov, Olga Lozynska	
<b>46. Analysis of Modeling Methods of Wind Energy Potential of a Region .....</b>	<b>175</b>
Vitalii Kravchyshyn, Mykola Medykovskyy	
<b>47. Training Future IT Professionals in Germany .....</b>	<b>179</b>
Myroslava Duzha-Zadorozhna, Svitlana Druzhbyak, Marianna Dilai	
<b>48. A Look Trough Methods of Intellectual Data Analysis and their Applying in Informational Systems .....</b>	<b>183</b>
Nataliya Boyko	
<b>49. The Commercial Content Digest Formation and Distributional Process .....</b>	<b>186</b>
Victoria Vysotska, Lyubomyr Chyrun, Liliya Chyrun	
<b>50. Content Linguistic Analysis Methods for Textual Documents Classification .....</b>	<b>190</b>
Vasyl Lytvyn, Victoria Vysotska, Oleh Veres, Ihor Rishnyak, Halya Rishnyak	
<b>51. Popularization of Website and Without Anchor Promotion .....</b>	<b>193</b>
Taras Basyuk	
<b>52. Banks Bankruptcy Risk Forecasting with Application of FNN .....</b>	<b>196</b>
Yuriy Zaychenko	

<b>53. Fuzzy System Diagnosing of Precancerous and Cancerous Conditions of the Breast</b> .....	<b>200</b>
Oleh Berezsky, Serhiy Verbovyi, Lesia Dubchak, Tamara Datsko	
<b>54. Multiple-valued Structures of Intellectual Systems</b> .....	<b>204</b>
Grygoryy Chetverikov, Oleksiy Puzik, Iryna Vechirska	
<b>55. Plasmon-polariton Waves in the Structures “Dielectric-Metal-Dielectric”: experiment and modeling</b> .....	<b>208</b>
Petro Kostrobiiy, V. Poliovyi. Volodymyr Pavlysh, Denys Nevinskyi	
<b>56. Information Technology of Processing Information Resources in Electronic Content Commerce Systems</b> .....	<b>212</b>
Victoria Vysotska, Lyubomyr Chyrun	