

# **2021 IEEE International Conference on Smart Information Systems and Technologies (SIST 2021)**

**Nur-Sultan, Kazakhstan  
28 – 30 April 2021**



**IEEE Catalog Number: CFP21X35-POD  
ISBN: 978-1-7281-7471-6**

**Copyright © 2021 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:	CFP21X35-POD
ISBN (Print-On-Demand):	978-1-7281-7471-6
ISBN (Online):	978-1-7281-7470-9

**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

# TABLE OF CONTENTS

<b>QUALITATIVE EVALUATION OF FACE EMBEDDINGS EXTRACTED FROM WELL-KNOWN FACE RECOGNITION MODELS .....</b>	<b>1</b>
<i>Rassul Tolegenov; Kairat Bostanbekov; Daniyar Nurseitov; Kuanysh Slyamkhan</i>	
<b>ESTABLISHMENT OF THE RATIONAL ECONOMIC AND ANALYTICAL BASIS FOR PROJECTS IN DIFFERENT SECTORS FOR THEIR INTEGRATION INTO THE TARGETED DIVERSIFIED PROGRAM FOR SUSTAINABLE ENERGY DEVELOPMENT .....</b>	<b>6</b>
<i>Ruslan Tormosov; Iurii Chupryna; Galyna Ryzhakova; Vadym Pokolenko; Dmytro Prykhodko; Adil Faizullin</i>	
<b>INFORMATION SYSTEM FOR VOCATIONAL GUIDANCE, EMPLOYMENT AND THE FORECASTING OF LABOR DEMAND: THE CASE OF KAZAKHSTAN .....</b>	<b>15</b>
<i>Yerken Turganbayev; Gainelgazy Adilgazinov; Yelena Barabanova; Aslanbek Zhakupov; Gulden Zhukibayeva</i>	
<b>SEMICONDUCTOR OPTICAL AMPLIFIERS FOR REACH EXTENSION OF WDM/TDM GIGABIT PASSIVE OPTICAL NETWORK .....</b>	<b>21</b>
<i>A. Tussupov; A. T Tokhmetov; N. I. Listopad</i>	
<b>DECIPHERING WIENER AND ASHBY BLACK BOX IN THE PROBLEM OF DYNAMIC IDENTIFICATION AND AUTOMATION OF METALLURGICAL PROCESS .....</b>	<b>27</b>
<i>Zhanbay Sh. Uzdenbayev; Ayazhan Ayaganova; Zhandos Zh. Uzdenbayev</i>	
<b>PROGRESS OF A MODEL FOR DETERMINING THE PROFICIENCY OF THE EDUCATORS .....</b>	<b>32</b>
<i>Wang Yingxing; Ryzhkov Oleksandr</i>	
<b>DIGITAL EDUCATION ECOSYSTEM (DEE) FOR A VIRTUAL MASTER SCHOOL .....</b>	<b>37</b>
<i>Carsten Wolff; Christian Reimann; Ekaterina Mikhaylova; Areej Aldaghamin; Sascha Pampus; Ekaterina Hermann</i>	
<b>A CONCEPTUAL RESEARCH MODEL FOR THE PARTNER SELECTION PROBLEM .....</b>	<b>44</b>
<i>Huilin Xu; Alexander Kuchansky; Svitlana Biloshchytska; Mykola Tsiutsiura</i>	
<b>NEWS POPULARITY PREDICTION USING TOPIC MODELLING .....</b>	<b>50</b>
<i>K. O. Yakunin; S. B. Murzakhmetov; R. R. Musabayev; R. I. Mukhamediyev</i>	
<b>STUDY OF AI GENERATED AND REAL FACE PERCEPTION .....</b>	<b>54</b>
<i>Gulzhan Yegemberdiyeva; Beibut Amirgaliyev</i>	
<b>IMITATION OF ACHIEVEMENT OF OBJECTIVES IN THE PROCESS OF CONFLICT OF SYSTEM .....</b>	<b>60</b>
<i>M. Yu Babich; M. M. Butaev; A. Yu Malygin; K. T. Sauanova; Sh. N. Sagyndykova</i>	
<b>DEVELOPMENT AND IMPLEMENTATION OF AUTOMATED UAV FLIGHT ALGORITHMS FOR INERTIAL NAVIGATION SYSTEMS .....</b>	<b>69</b>
<i>A. Yemelyev; K. Moldamurat; R. B. Seksenbaeva</i>	
<b>DIGITAL MATURITY AND READINESS MODEL FOR KAZAKHSTAN SMES .....</b>	<b>74</b>
<i>Assel Yezhebay; Venera Sengirova; Dastan Igali; Yasser Omar Abdallah; Essam Shehab</i>	
<b>BUILDING A SYSTEM FOR PREDICTING THE YIELD OF GRAIN CROPS BASED ON MACHINE LEARNING USING THE XGBREGRESSOR ALGORITHM .....</b>	<b>80</b>
<i>Zhagparov; Z. Buribayev; S. Joldasbayev; A. Yerkosova; M. Zhassuzak</i>	
<b>THE DEVELOPMENT OF A RISK ASSESSMENT MODELING FOR THE POWER SYSTEM OF KAZAKHSTAN .....</b>	<b>85</b>
<i>Svitlana Zhakiyeva; Mars Gabbassov; Yerbol Akhmetbekov; Gulvira Akybayeva; Nurkhat Zhakiyev</i>	
<b>DEVELOPMENT OF A MOCKUP OF A MOBILE RADIO-CONTROLLED SWIMMING APPARATUS FOR ENVIRONMENTAL MONITORING .....</b>	<b>89</b>
<i>Makpal Zhartybayeva; Adilkhan Ibragim; Zhanar Oralbekova; Nurzhan Muntayev</i>	
<b>GAIT BASED PERSON RECOGNITION .....</b>	<b>94</b>
<i>M. Zhassuzak; A. Turegali; Y. Amirgaliyev; Z. Buribayev</i>	
<b>HEALTH MONITORING SYSTEM USING INTERNET OF THINGS .....</b>	<b>99</b>
<i>Nurassyl Zholdas; Octavian Postolache; Madina Mansurova</i>	
<b>HR-HARMONIZATION OF THE CHINESE INTERNATIONAL EDUCATIONAL SERVICE SYSTEM .....</b>	<b>103</b>
<i>Zhou Huan; Ryzhkov Oleksandr</i>	
<b>APPLICATION OF AGILE METHODOLOGY IN PLANNING A JOINT EDUCATIONAL PROGRAM .....</b>	<b>108</b>
<i>Ting Zhu; Oleksandr Ryzhkov</i>	

<b>USING ITEM RESPONSE THEORY IN MACHINE LEARNING ALGORITHMS FOR STUDENT RESPONSE DATA .....</b>	<b>113</b>
<i>T. Merembayev; S. Amirgaliyeva; K. Kozhaly</i>	
<b>BUS ARRIVAL TIME PREDICTION: A CASE STUDY FOR ALMATY .....</b>	<b>118</b>
<i>Aidana Baimbetova; Kulyash Konyrova; Aigerim Zhumabayeva; Yerkezhan Seitbekova</i>	
<b>ANALYSIS AND MODELING INDICATORS OF AIC OF KAZAKHSTAN IN THE CONDITIONS OF DIGITAL ECONOMY .....</b>	<b>124</b>
<i>G. E. Nakipova; T. L. Ten; V. G. Drozd; L. S. Smirnov; G. D. Kogay; A. V. Suvorova</i>	
<b>CONCEPTUAL MODEL FOR ASSESSING THE COMPETITIVENESS OF THE ENTERPRISE BASED ON FUZZY LOGIC: SOCIAL AND RESOURCE FACTORS.....</b>	<b>129</b>
<i>Olha Bielienskova; Sergii Stetsenko; Sergii Oliferuk; Petro Sapiga; Maksym Horbach; Sapar Toxanov</i>	
<b>FORMALIZATION OF THE SYSTEM OF INDICATORS OF ECONOMIC STABILITY OF THE CONSTRUCTION ENTERPRISE IN THE CONDITIONS OF DIGITIZATION OF ECONOMY .....</b>	<b>134</b>
<i>Chupryna Khrystyna; Huliaiev Dmytro; Andrii Derkach; Anton Rovenskyy; Alexander Slipenchuk; Aidos Mukhatayev</i>	
<b>PRINCIPLES OF ROBOTIZATION IN EDUCATION.....</b>	<b>139</b>
<i>Malik Baimukhamedov; Mustafa Kemal Akgul; Serik Eslyamov</i>	
<b>DISTANCE LEARNING AT KAZNPU NAMED AFTER ABAI: MODELS AND TECHNOLOGIES .....</b>	<b>143</b>
<i>Takir Balykbayev; Darazha Issabayeva; Lyazzat Rakhimzhanova; Shaizat Zhanyzbekova</i>	
<b>SOFT SKILLS AS THE MOST IN-DEMAND SKILLS OF FUTURE IT SPECIALISTS .....</b>	<b>149</b>
<i>Saule Burbekova</i>	
<b>BOUNDARY AND CURRENT ELEMENTS FOR SIMULATION OF ELECTROMAGNETIC FIELDS.....</b>	<b>154</b>
<i>Seitkerim Bimurzaev; Zerde Sautbekova; Andrey Trubitsyn</i>	
<b>INFORMATION SUPPORT SYSTEM OF INNOVATIVE ACTIVITY AS ELEMENT OF INFRASTRUCTURE OF THE INNOVATIONS REPUBLIC OF KAZAKHSTAN .....</b>	<b>159</b>
<i>L. Bobrov; I. T. Utepbergenov; I. A. Fedorenko; I. P. Medyankina; Z. V. Rodionova; N. Mikhaylenko</i>	
<b>MODELLING OF CREATION ORGANISATIONS ENERGY-ENTROPY .....</b>	<b>166</b>
<i>Bondar Alla; Bushuyeva Nataliya; Bushuyev Sergey; Onyshchenko Svitlana</i>	
<b>TOWARDS A NATIONAL DIGITAL COMPETENCE FRAMEWORK FOR UKRAINE.....</b>	<b>172</b>
<i>Sergiy Bronin; Andreas Pester</i>	
<b>THE OPTIMIZED DISTANCE CALCULATION METHOD WITH STEREO CAMERA FOR AN AUTONOMOUS TOMATO HARVESTING .....</b>	<b>177</b>
<i>Z. Buribayev; T. Merembayev; Y. Amirgaliyev; T. Miyachi</i>	
<b>USING SMARTPHONES IN HOME EDUCATION TO PERFORM PHYSICS LAB .....</b>	<b>182</b>
<i>Aigerim Abdulayeva</i>	
<b>“INFODEMIA VS. PANDEMIA, COVID 2019” MANAGEMENT PROJECTS WITH CRITICAL THINKING .....</b>	<b>186</b>
<i>Sergey Bushuyev; Denis Bushuiev; Victoria Bushuieva</i>	
<b>STRATEGIC AUDIT BASED ON THE COMPETENCE APPROACH IN AGILE TRANSFORMATION OF EDUCATION ESTABLISHMENT .....</b>	<b>195</b>
<i>Sergey Bushuyev; Svetlana Murzabekova; Maira Khusainova</i>	
<b>MANAGING PROJECT SUCCESS WITH "INFODEMIC" VS "PANDEMIC" ENVIRONMENT ON THE COVID – 19 PANDEMIC CASE.....</b>	<b>203</b>
<i>Sergey Bushuyev; Iqbal Babayev; Victoria Bushuieva; Nataliya Bushuyeva; Jahid Babayev; Denis Bushuiev</i>	
<b>MODELING LEADERSHIP FOR DEVELOPING INFORMATION TECHNOLOGIES BASED ON AGILE METHODOLOGY.....</b>	<b>210</b>
<i>Sergey Bushuyev; Natalia Bushuyeva; Denis Bushuiev; Iqbal Babayev; Jahid Babayev</i>	
<b>USING THE INTERNET OF THINGS (IOT) FOR NATURAL RESOURCES MONITORING SYSTEM.....</b>	<b>218</b>
<i>N. N. Demidchik; M. D. Kudaibergenova; A. Z. Kintonova</i>	
<b>CALCULATION OF THE COMPETITIVENESS FACTORS OF INTERNATIONAL EDUCATIONAL PROGRAMS OF SHANGHAI TRANSPORT UNIVERSITY AND WEIHAI VOCATIONAL COLLEGE .....</b>	<b>223</b>
<i>Chen Jie; Ryzhkov Oлександр</i>	
<b>DIGITAL TRANSFORMATION OF ENTERPRISES IN EMERGING ECONOMIES .....</b>	<b>228</b>
<i>Dinara Dikhanbayeva; Zhanybek Suleiman; Dauren Nurmaganbetov; Nurlan Ibraimov; Chinwi Mgbere; Ali Turkylmaz</i>	
<b>MANAGING THE TRANSFORMATION OF RELATIONS BETWEEN THE STATE, THE CITY AND CITIZENS ON THE EXAMPLE OF IKOMEK109 - DIGITAL SERVICE MODEL OF NURSULTAN CITY .....</b>	<b>234</b>
<i>Zhanat Dubirova; Birlık Mendybayev</i>	

<b>AN IMPROVED PARTICLE SWARM OPTIMIZATION METHOD FOR MOTION PLANNING OF MULTIPLE ROBOTS</b> .....	239
<i>Zhanna Gabbassova</i>	
<b>QUALIFICATION AND APPOINTMENT OF STAFF FOR PROJECT WORK IN IMPLEMENTING IT SYSTEMS UNDER CONDITIONS OF UNCERTAINTY</b> .....	246
<i>Myroslava Gladka; Olga Kravchenko; Yaroslav Hladkyi; Sholpan Borashova</i>	
<b>STUDY AND SIMULATION OF CONTROL SYSTEM OF THE PROCESS OF ROASTING IN FLUIDIZED BED FURNACES OF POLYMETALLIC SULFIDE ORES UNDER UNCERTAINTY</b> .....	252
<i>Gulnara Abitova; Elvira Abdrakhmanova; Zamira Bekish; Tansuly Zadenova; Leila Rzayeva; Korlan Kulniyazova</i>	
<b>NEURAL NETWORK ESTIMATION MODEL TO OPTIMIZE TIMING AND SCHEDULE OF SOFTWARE PROJECTS</b> .....	258
<i>Mohamed A. Hamada; Abdelrahman Abdallah; Mahmoud Kasem; Mohamed Abokhalil</i>	
<b>ESTIMATE THE EFFICIENCY OF MULTIPROCESSOR'S CASH MEMORY WORK ALGORITHMS</b> .....	265
<i>Mohamed A. Hamada; Abdelrahman Abdallah</i>	
<b>SURVEY ON NOMA AND SPECTRUM SHARING TECHNIQUES IN 5G</b> .....	270
<i>Mohamed Hassan; Manwinder Singh; Khalid Hamid</i>	
<b>LAUNCHING THE DIGITAL LEARNING PORTAL FOR PRIMARY SCHOOL TEACHER TRAINING</b> .....	274
<i>Liudmyla Havrilova; Olena Beskorsa; Olena Ishutina</i>	
<b>PROBLEMS IN AIR QUALITY MONITORING AND ASSESSMENT</b> .....	281
<i>Yuanfang He; Alexander Kuchansky; Sergiy Paliy; Yevhenia Shabala</i>	
<b>A CONCEPTUAL RESEARCH MODEL OF DEVELOPMENT OF THE GEOGRAPHIC INFORMATION SYSTEM FOR AGRICULTURE</b> .....	285
<i>Mingxin Huang; Andrii Biloshchytskyi; Yurii Andrashko; Serik Omirbayev</i>	
<b>A NOVEL INTERVENTION TO ENHANCE TRANSOCEANIC FIBER EFFECTIVENESS THROUGH ADVANCED QX 5252 CMOS DRIVER</b> .....	290
<i>Elsayed Imadeldin Elmutasim; Mohd Izzeldin</i>	
<b>COMPARISON OF THE SELF-PILOTING CONSTRUCTIVE AND DESTRUCTIVE INTERFERENCE IN 7 AND 23 GHZ BAND OVER THE SEAWATER SURFACE</b> .....	295
<i>Elsayed Imadeldin Elmutasim; Mohd Izzeldin</i>	
<b>CONCEPTUAL RESEARCH MODEL OF DEVELOPING THE DECISION SUPPORT SYSTEM FOR AGRICULTURE UNDER UNCERTAINTY</b> .....	299
<i>Chunmei Ji; Yurii Andrashko; Svitlana Biloshchytska; Svitlana Tsiutsiura</i>	
<b>OPTIMIZING NEURAL NETWORK PERFORMANCE TO PREDICT CORONARY HEART DISEASE</b> .....	304
<i>Azat Kabdullin; Maxat Kabdullin; Lyazat Naizabayeva</i>	
<b>CONTACT CENTERS MANAGEMENT MODELS: ANALYSIS AND RECOMMENDATIONS</b> .....	308
<i>Bekmurza Aitchanov; Olimzhon Baimuratov; Muratbek Zhussupekov; Tleu Aitzhanov</i>	
<b>SPEAKER RECOGNITION FROM SPECTROGRAM IMAGES</b> .....	313
<i>Shirali Kadyrov; Cemil Turan; Altynbek Amirzhanov; Cemal Ozdemir</i>	
<b>AUTOMATIC LANGUAGE IDENTIFICATION FROM SPECTROGRAM IMAGES</b> .....	317
<i>Aizada Kaiyr; Shirali Kadyrov; Andrey Bogdanchikov</i>	
<b>CLASSIFICATION AND PREDICTION OF STUDENT'S ENROLLMENT TO KAZAKHSTANIS UNIVERSITIES USING CHARACTERISTICS OF APPLICANT AND TESTING RESULTS</b> .....	321
<i>Aidana Kalakova; Yerasyl Amanbek; Rasul Kairgeldin; Gulsim Kalakova</i>	
<b>CORNER DETECTION BASED ON SCALABLE MASKS</b> .....	328
<i>I. G. Kazantsev; B. O. Mukhametzhanova; Suvorovsky O. Yu</i>	
<b>THE USAGE OF EXTENDED KALMAN FILTER TO INCREASE NAVIGATION ACCURACY OF MOBILE UNITS IN CLOSED SPACES</b> .....	334
<i>Kereyev K. Adilzhan; Atanov K. Sabyrzhan; Toleuov Zh. Timur</i>	
<b>IN-FIELD CROP-WEED CLASSIFICATION USING REMOTE SENSING AND NEURAL NETWORK</b> .....	339
<i>Seyit Kerimkhulle; Zhandos Kerimkulov; Dias Bakhtiyarov; Nazerke Turtayeva; Jong Kim</i>	
<b>DEVELOPMENT OF THE PATIENT-SPECIFIC OCULAR MODELS USING OPTICAL COHERENCE TOMOGRAPHY IMAGES: GLAUCOMA MODEL</b> .....	345
<i>Chingis Kharmyssov; Alshyn Abduvalov; Konstantinos Kostas; Yerkin G. Abdildin; Zaure Dzhumatayeva</i>	
<b>AN INVESTIGATION STUDY ON CAPABLE OF ENHANCING TTOS FOR INTELLECTUAL PROPERTY MANAGEMENT SYSTEMS IN KAZAKHSTAN</b> .....	351
<i>Anel Kireyeva; Sharbanu Turdalina; Marat Urdabayev; Zaira Satpayeva</i>	

<b>ANALYSIS OF BITCOIN TRANSACTIONS TO DETECT ILLEGAL TRANSACTIONS USING CONVOLUTIONAL NEURAL NETWORKS .....</b>	<b>355</b>
<i>Kateryna Kolesnikova; Olga Mezentseva; Tleuzhan Mukatayev</i>	
<b>MARKOV PRINCIPLES OF PROJECT EFFECTIVENESS .....</b>	<b>361</b>
<i>Kateryna Kolesnikova; Tetiana Olekh; Dmytro Lukianov; Danso Janet Obenewaa</i>	
<b>APPLICATION OF GMTSAR AND ESA SNAP SOFTWARE TO DETERMINE EARTHQUAKE EPICENTER COORDINATE USING SENTINEL-1A/B RADAR REMOTE SENSING DATA .....</b>	<b>367</b>
<i>Akhmadiya Asset; Moldamurat Khuralay; Nabiyeu Nabi; Kismanova Aigerim</i>	
<b>COMPLEX DYNAMIC METHOD OF WEB APPLICATIONS VERIFICATION BY THE CRITERION OF TIME MINIMIZATION .....</b>	<b>373</b>
<i>Yurii Kravchenko; Oleksandr Makhovych; Anton Yakymenko; Serhii Salkutsan; Maksym Tyshchenko; Gulnur Smagulova</i>	
<b>INFORMATION - EDUCATION MILIEU: METHODOLOGY OF FORMING KNOWLEDGE CONTENT AND PRACTICE ORIENTED TRAINING OF IT-DISCIPLINES .....</b>	<b>378</b>
<i>B. S. Kubekov; V. V. Naumenko; A. Y. Ibraimkulov</i>	
<b>AUTOMATIC SUMMARIZING THE NEWS FROM INFORM.KZ BY USING NATURAL LANGUAGE PROCESSING TOOLS .....</b>	<b>387</b>
<i>Bakdaulet Kynabay; Aimoldir Aldabergen; Azamat Zhamanov</i>	
<b>TRANSFORMING CONFERENCES TO AN ONLINE FORMAT: FRAMEWORK AND PRACTICES .....</b>	<b>391</b>
<i>Nargiza Mikhridinova; Anna Badasian; Areej Aldaghamin; Carsten Wolff</i>	
<b>A CONCEPTUAL MODEL FOR DIVERSIFICATION STRATEGIES CHOICE .....</b>	<b>399</b>
<i>Yuanyuan Li; Andrii Biloshchyskyi; Sergiy Bronin; Tamara Liashchenko</i>	
<b>INTEGRATED OPERATION PLATFORM IN PROJECT FOR DEVELOPMENT OF A GAS CLEANING DEVICES FOR VENTILATION SYSTEMS .....</b>	<b>403</b>
<i>Li Ming; Ryzhkov Oleksandr</i>	
<b>TRANSFORMATION DIGITAL COMPETENCE AREA IN THE COMPETENCE MODEL OF PROJECT MANAGERS.....</b>	<b>407</b>
<i>Dmytro Lukianov; Krystsina Mazhei; Viktor Gogunskii; Oleksii Kolesnikov</i>	
<b>ABSTRACTING TEXT CONTENT BASED ON WEIGHING THE TF-IDF MEASURE BY THE SUBJECT AREA ONTOLOGY .....</b>	<b>413</b>
<i>Vasyl Lytvyn; Yevhen Burov; Victoria Vysotska; Yulia Pukach; Oksana Tereshchuk; Iryna Shakleina</i>	
<b>MODELLING OF THE INTELLIGENT AGENT'S BEHAVIOR SCHEDULER BASED ON PETRI NETS AND ONTOLOGICAL APPROACH.....</b>	<b>420</b>
<i>Vasyl Lytvyn; Myroslava Bublyk; Victoria Vysotska; Valentyna Panasyuk; Oksana Brodyak; Mykhailo Luchkevych</i>	
<b>AUTOMATED ATTENDANCE-CHECKING SYSTEM USING BLUETOOTH .....</b>	<b>426</b>
<i>Yerzhan Mademikhanov; Anuar Otynshin; Rustam Shumenov; Mona Rizvi</i>	
<b>USING WAVELET TRANSFORM AND MACHINE LEARNING TO PREDICT HEART FIBRILLATION DISEASE ON ECG .....</b>	<b>432</b>
<i>D. Zh. Akhmed-Zaki; T. S. Mukhambetzhano; Zh. M. Nurmakhanova; Z. M. Abdiakhmetova</i>	
<b>USING A VISUAL PROGRAMMING ENVIRONMENT TO CALCULATE CATENARY SYSTEM MODE OF A MINING ENTERPRISE.....</b>	<b>438</b>
<i>Bezzub Maksym; Oleksii Bialobrzheskyi; Serhiy Yakimets</i>	
<b>NAMED ENTITY EXTRACTION MODEL BASED ON THE RANDOM WALK METHOD .....</b>	<b>444</b>
<i>Madina Mansurova; Vladimir Barakhnin; Marzhan Kyrgyzbayeva; Nurgali Kadyrbek</i>	
<b>STUDYING A FACE SEARCH METHOD BASED ON THE IDEA OF SPARSE DATA REPRESENTATION BY GENERATING RANDOM POINTS .....</b>	<b>450</b>
<i>K. S. Maulenov; S. A. Kudubayeva; A. A. Uvaliyeva</i>	
<b>STATISTICAL AND NETWORK ANALYSIS OF SHARED BIKES – IN THE CASE OF ALMATY BIKE .....</b>	<b>456</b>
<i>Almasbek Maulit; Yerzhan Baiburin; Madiyar Rakhymbek; Gulnara Sadykova; Aliya Nugumanova</i>	
<b>DIGITAL TRANSFORMATION: A CASE STUDY OF ORGANIZATIONAL AND FUNCTIONAL CHANGES OF THE PUBLIC SERVICES PROVIDER .....</b>	<b>461</b>
<i>B. Mendybayev; P. Burbayeva</i>	
<b>A COMPUTER VISION SUPPORTED INVESTIGATION ON ANXIETY-SUCCESS RELATIONSHIP IN EDUCATIONAL PROCESSES.....</b>	<b>467</b>
<i>Bakhtiyor Meraliyev; Kurmangazy Kongratbayev; Marzhan Bekbalanova; Cemil Turan</i>	
<b>CONTENT ANALYSIS OF EXTRACTED SUICIDE TEXTS FROM SOCIAL MEDIA NETWORKS BY USING NATURAL LANGUAGE PROCESSING AND MACHINE LEARNING TECHNIQUES .....</b>	<b>473</b>
<i>Bakhtiyor Meraliyev; Kurmangazy Kongratbayev; Nazerke Sultanova</i>	

<b>DIGITAL EDUCATION ECOSYSTEM (DEE): USER-CENTRED DESIGN OF THE STUDENT JOURNEY CONFIGURATOR</b> .....	479
<i>Ekaterina Mikhaylova; Areej Aldaghamin; Felix Ebberg; Olzhas Tokanov; Carsten Wolff; Christian Reimann</i>	
<b>ELABORATION OF COMMUNICATION MODELS IN ADAPTIVE SYSTEMS OF E-LEARNING WITH USING NEURAL NETWORKS</b> .....	487
<i>Viktor Morozov</i>	
<b>DEVELOPMENT OF OPTIMIZATION MODELS OF COMPLEX INFOCOMMUNICATION PROJECTS BASED ON DATA MINING</b> .....	492
<i>Viktor Morozov; Olga Mezentseva</i>	
<b>DEVELOPMENT OF WEB APPLICATION FOR VISUALIZING CITY EMERGENCIES</b> .....	499
<i>Darkhan Akhmed-Zaki; Madina Mansurova; Aybek Yertuyak; Darya Chikibayeva</i>	
<b>FEATURES OF HARDWARE AND SOFTWARE SMOOTHING OF EXPERIMENTAL DATA OF GAS SENSORS</b> .....	504
<i>Zhanna Mukanova; Sabyrzhan Atanov; Mohammad Jamshidi</i>	
<b>UPLOADING UNSTRUCTURED DATA TO MONGODB USING THE NOSQLBOOSTER TOOL</b> .....	510
<i>Assel Mukasheva; Didar Yedilkhan; Igor Zimin</i>	
<b>RESEARCH OF THE REGRESSION ANALYSIS METHODS FOR PREDICTING THE GROWTH OF PATIENTS WITH DIABETES MELLITUS</b> .....	514
<i>Assel Mukasheva; Zhanay Akanov; Didar Yedilkhan</i>	
<b>HYBRID ARCHITECTURE OF FACE AND ACTION RECOGNITION SYSTEMS FOR PROCTORING ON A GRAPHIC PROCESSOR</b> .....	521
<i>A. A. Mukhanbet; E. S. Nurakhov; T. S. Imankulov</i>	
<b>PREDICTIVE MODEL FOR THE IMPACT OF ONLINE EXAMS ON THE FINAL SEMESTER GRADE</b> .....	525
<i>Mohamed Mutasim Elkir Alsadig</i>	
<b>CRITICAL SUCCESS FACTORS OF DIGITALIZATION OF KAZAKHSTAN MANUFACTURING INDUSTRY</b> .....	532
<i>Saltanat Nurbossynova; Azamat Sautbekov; Baiken Zholdaskhan; Yasser Abdallah; Essam Shehab</i>	
<b>THE ROLE OF MANAGEMENT INFORMATION SYSTEMS AND TECHNOLOGY ON BUSINESS PROFITABILITY</b> .....	538
<i>Almira Nygiyeva; Ali Zhumaly; Aierke Soltanbayeva; Sultan Maksat; Mohamed A. Hamada</i>	
<b>DEVELOPING PREDICTIVE OIL WELL DIAGNOSTICS BASED ON INTELLIGENT ALGORITHMS</b> .....	542
<i>Zhanar Omirbekova; Daur Aktaukenov; Aslan Amangeldiyev; Abdelrahman Abdallah</i>	
<b>CURRENT REVIEW OF USING DIFFERENT GREEN TECHNOLOGIES IN KAZAKHSTAN</b> .....	549
<i>Ruslan Omirgaliyev; Samat Kassymkhanov</i>	
<b>ONLINE ENERGY EFFICIENCY LEARNING FOR UPLINK TRANSMISSION IN DYNAMIC H-CRAN</b> .....	554
<i>Marat Orynbet; Meruyert Makhanbet; Zharkyn Makhanbet</i>	
<b>PARALLEL IMPLEMENTATION OF THE ALGORITHM FOR SOLVING A PARTIAL DIFFERENTIAL EQUATION WITH A FRACTIONAL DERIVATIVE IN THE SENSE OF RIEMANN-LIOUVILLE</b> .....	560
<i>Nurlana Alimbekova; Abdumauvlen Berdyshev; Dossan Baigereyev</i>	
<b>KAZRIVDYN: TOOLKIT FOR MEASURING THE DYNAMICS OF KAZAKHSTAN RIVERS WITH A GRAPHICS BASED ON GOOGLE EARTH ENGINE</b> .....	566
<i>Assel Ospan; Madina Mansurova; Erkin Kakimzhanov; Baurzhan Aldakulov</i>	
<b>STOCHASTIC PSEUDO-SPIN NEURAL NETWORK WITH TRIDIAGONAL SYNAPTIC CONNECTIONS</b> .....	570
<i>Roman Peleshchak; Vasyly Lytvyn; Ivan Peleshchak; Victoria Vysotska</i>	
<b>TO THE ISSUE OF MONITORING THE STATE OF INSULATION OF COUPLINGS AND CABLE LINES DURING CONSTRUCTION OF DIGITAL SUBSTATIONS IN THE REPUBLIC OF KAZAKHSTAN</b> .....	576
<i>Ruslan Rakhimov</i>	
<b>USE OF FOURIER TRANSFORM TO DETECT THE RELATIONSHIP BETWEEN VOLTAGE AND CURRENT DISTORTION OF THE TRANSFORMER WITH DAMAGE TO THE WINDING</b> .....	580
<i>Ihor Reva; Oleksii Bialobrzheskyi; Andrii Lomonos</i>	
<b>DEVELOPMENT OF INTEGRATED INFORMATION SYSTEMS TO SUPPORT SCIENTIFIC ACTIVITY</b> .....	586
<i>Z. B. Sadirmekova; J. A. Tussupov; M. A. Sambetbayeva; Z. T. Altynbekova</i>	
<b>AFFINE TRANSFORMATION METHOD FOR SOLVING DIOPHANTINE EQUATIONS WITH RESPECT TO POLYNOMIALS OF THE SECOND DEGREE</b> .....	592
<i>B. Sagindykov; Z. Bimurat</i>	

<b>AN INTELLIGENT DECISION SUPPORT SYSTEM FOR AIRCRAFT LANDING BASED ON THE RUNWAY SURFACE</b> .....	597
<i>Zhexen Y. Seitbattalov; Sabyrzhan K. Atanov; Zhanar S. Moldabayeva</i>	
<b>IMPACT OF COVID-19 ON INDUSTRY 4.0 IMPLEMENTATION: KAZAKHSTAN INDUSTRY CASE</b> .....	602
<i>Sabit Shaikholla; Dinara Dikhanbayeva; Zhanybek Suleiman; Essam Shehab; Ali Turkyilmaz</i>	
<b>EXTRACTION OF BOLSHAYA SARYOBA LAKE FEATURES USING SENTINEL – 2A IMAGERY</b> .....	608
<i>D. M. Shaimerdenov; D. K. Koshanova; A. B. Zakirova</i>	
<b>APPLICATION OF GPR RESEARCH FOR THE DIAGNOSIS OF DECOMPACTION ZONES OF COAL MASSIF OF SHUBARKOL FIELD</b> .....	612
<i>Aliya Shakhatova; Maxim Shishlenin; Tolkyn Mirgalikyzy; Vasily Portnov</i>	
<b>DIGITAL MATURITY AND READINESS MODEL FOR MULTIPLE-CASE OF KAZAKHSTAN LARGE COMPANIES</b> .....	617
<i>Aidana Almasbekkyzy; Daulet Abdikerim; Daulet Nabi; Yasser Omar Abdallah; Essam Shehab</i>	
<b>DESCRIPTIVE BIG DATA ANALYTICS IN THE FIELD OF EDUCATION</b> .....	624
<i>B. K. Shayakhmetova; S. S. Ayazhanov; S. E. Omarova; T. L. Ten; V. G. Drozd; A. M. Medeubaeva</i>	
<b>APPLICATION OF GAMIFICATION TOOL IN HAND REHABILITATION PROCESS</b> .....	629
<i>Adilkhan Shyngys; Alimanova Madina</i>	
<b>THE DEVELOPMENT OF STAKEHOLDERS’ INTERACTION MODEL IN SEAFARERS’ TRAINING</b> .....	633
<i>Tetiana Shelest; Oleksii Kolesnikov; Andrii Biloshchytskyi</i>	
<b>ANALYSIS OF EDUCATIONAL TRANSFORMATION AT ASTANA IT UNIVERSITY (AITU)</b> .....	639
<i>Leila Salykova; Nurkhat Ibadildin; Sholpan Borashova</i>	
<b>METHODS FOR AN INTELLECTUAL INFORMATION LEARNING SYSTEM</b> .....	643
<i>Assel Smayil; Marco Brambilla; Abu Kuandykov; Zhibek Sarsenova</i>	
<b>IDENTIFYING THE CYBERCRIME AWARENESS OF UNDERGRADUATE AND POSTGRADUATE STUDENTS: EXAMPLE OF KAZAKHSTAN</b> .....	647
<i>Demet Soyulu; Tunç Durmus Medeni; Regina Andekina; Rakhila Rakhmetova; Rita Ismailova</i>	
<b>INTELLIGENT DATA ANALYSIS FOR INDIVIDUAL HYPERTENSIA PATIENT'S STATE MONITORING AND PREDICTION</b> .....	654
<i>Sergey Subbotin; Galyna Tabunshchyk; Peter Arras; Daria Tabunshchyk; Eduard Trotsenko</i>	
<b>COMPARATIVE ANALYSIS OF TEXTS BY F. M. DOSTOEVSKY AND OTHER AUTHORS USING DECISION TREES</b> .....	658
<i>T. G. Surovtsova; N. D. Moskin; D. A. Mokerova</i>	
<b>INTRODUCTION OF ARTIFICIAL INTELLIGENCE AS THE BASIS OF MODERN ONLINE EDUCATION ON THE EXAMPLE OF HIGHER EDUCATION</b> .....	663
<i>Aigul Syzdykbayeva; Aigerim Baikulova; Rysty Kerimbayeva</i>	
<b>VIRTUAL INSTRUMENT MODULE FOR DETECTING CURRENT AND VOLTAGE DISTORTION IN THREE-PHASE NETWORKS</b> .....	671
<i>Oleh Todorov; Oleksii Bialobrzheskyi; Serhiy Yakimets</i>	
<b>ACADEMIC - INDUSTRY PARTNERSHIP: DEVELOPMENT IT SECTOR IN KAZAKHSTAN</b> .....	676
<i>Kamshat Asmaganbetova; Nazgul Yeleussizova; Alan Swindell Ceng Micheme; Aidiye Aidarbekov; Abzal Kyzyrkanov; Diana Burissova</i>	
<b>IMPLEMENTATION OF AN INTELLIGENT CONTROL SYSTEM FOR HEAT DISTRIBUTION IN ROOMS</b> .....	682
<i>N. M. Tasmurzayev; B. S. Amangeldy; E. S. Nurakhov; A. A. Mukhanbet; Zh. Yeltay</i>	
<b>Author Index</b>	