

25th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2021)

Online
18 - 21 July 2021

Volume 1 of 3

Editors:

**Nagib Callaos
Natalja Lace**

**Belkis Sanchez
Michael Savoie**

ISBN: 978-1-7138-3519-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2021) by International Institute of Informatics and Systemics (IIIS)
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact International Institute of Informatics and Systemics (IIIS)
at the address below.

International Institute of Informatics and Systemics (IIIS)
13750 West Colonial Dr.
Suite 350-408
Winter Garden, Florida 34787
USA

Contact-us@iiis.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Volume I

Table of Contents	i
Computer Science and Engineering	
Carta, Kévin; Barral, Claude; El Mrabet, Nadia; Mouille, Stéphane (France): "On the Pitfalls of Videoconferences for Challenge-Based Face Liveness Detection"	1
Cherinka, R.; Prezzama, J. (USA): "Adopting Agile Practices: Lessons Learned Transforming Organizations That Do Not Develop Software"	7
Pola, Eddy A.; López, Máximo; González, J. Gabriel; González, Nimrod; Mújica, Dante; Santamaría, Guillermo (Mexico): "A Novel IDS Model Oriented to Drone Nodes Networks Threatened for DoS Attacks"	13
Siddiqui, Rida; Moin, Lubna (Pakistan): "An Optimal Path Planning Approach for a Two Wheeled Mobile Robot Using Free Segment and Turning Point Algorithm"	19
Computing Techniques	
Alanís Urquieta, José David; Bermúdez Juárez, Blanca; Vazquez Mora, Paulo Daniel; Hernández Flores, Armando (Mexico): "Numerical Solution of the Partial Differential Equation Bilaplacian Type by the Finite Element Method for the Simulation of Accelerometer-Type MEMS"	25
Fiuza, Mariana; Hiram, Kechi (Brazil): "Test-Driven Development Effects on Software Quality and Developer Productivity Analysis"	31
Morales-Marquez, Luis-Enrique; Carrasco-Limon, Odón-David; Bermudez-Juarez, Blanca; Alanis-Urquieta, José-David (Mexico): "A Comparison of Runtime of Simplex versus Karmarkar, Affine Scaling and Ruiz-Paredes Inner Point Methods"	39
Patterson, Wayne (USA): "Analysis of Risks to Data Privacy Throughout European Countries"	45
Radev, Ivan (USA): "Context-Free Grammars from the Computing Theory Perspective"	51
Thabit, Khalid (Saudi Arabia): "A Characters Prefix Based Methodology for Enhancing the Execution Performance of Any String Sorting Algorithm"	57
Development Methods and Methodologies	
Hadámek, Tomáš *; Selberherr, Siegfried *; Goes, Wolfgang **; Sverdlov, Viktor * (* Austria, ** UK): "Heating Asymmetry in Magneto-resistive Random Access Memories"	63

La Manna, Mario (Italy): "Multidisciplinary Threat Recognition in Homeland Protection Systems"	67
Munlin, Mudarmeen (Thailand): "Solving Knapsack Problems Using Radius Particle Swarm Optimization Fuse with Simulated Annealing"	71
Tudjarov, Boris; Panov, Vesko (Bulgaria): "Web Based Approach for Discovering and Prevention of Customs Violations by Application of Emotional Model"	77

Information and Cyber Security

Blair, Risa (USA): "Encryption Challenges: What Are We Facing?"	83
Iacoviello, Giuseppina; Bruno, Elena; Cavallini, Iacopo (Italy): "Cyber Security in the Age of Covid 19 Pandemic: An Empirical Model to Manage the Risk in Banks"	88
Scholl, Margit (Germany): "Spotlight on Information Security Integration in the German Health Sector"	95
Villacís, Johanna *; Pintag, Marco *; Fernández-Peña, Félix *; Andrade, Roberto *; Sánchez, Manuel **; Fuertes, Walter *; Benavides, Eduardo *; Ron, Mario * (* Ecuador, ** Spain): "Social Engineering Attacks: A Systematic Mapping Study"	103

Information Systems, Technologies and Applications

Azar, Ghassan; El-Bathy, Naser; Chen, Mengyi; Runwal, Sonali Dilip; Azar, Nawal (USA): "Intelligent Extended XGBoost Algorithm for Psychiatric Diagnosis"	109
Bansal, Benu; Hu, Wen-Chen; Kaabouch, Naima (USA): "Detecting Mobile Pandemic Misinformation by Using Mobile Text/Data Mining"	114
Barczak, Andrzej; Barczak, Michał (Poland): "Performance Comparison of Monolith and Microservices Based Applications"	120
Gottimukkala, Raga; Jenq, John (USA): "The Impact and Trend of Virtual Currency"	126
Zeng, David; Noteboom, Cherie; Sutrave, Kruttika; Godasu, Rajesh (USA): "A Meta-Analysis of Evolution of Deep Learning Research in Medical Image Analysis"	131

Towards Business Sophistication and Sustainability - Invited Session

Organizer: Natalja Lace (Latvia)

Čirjevskis, Andrejs *; Fialeix, Julien ** (* Latvia, ** Spain): "Exploring Critical Success Factors of Reciprocal Synergy in Strategic Alliances: The Renault-Nissan-Mitsubishi Strategic Alliance"	137
Lace, Natalja; Pokromovica, Iveta (Latvia): "Innovative Behaviour of Latvian Companies During COVID-19 Pandemic"	143

Liu, Yuan Yuan *; Lace, Natalja ** (* China, ** Latvia): "Predicting the Actual Behavior of Customers to Purchase Through an Online Platform"	149
Liu, Yuan Yuan *; Lace, Natalja ** (* China, ** Latvia): "The Performance of Digital Campaign for Smart Tourism and on-Line Purchasing – The Case of China"	155
Oganišjana, Karine; Kozlovskis, Konstantins (Latvia): "Male vs. Female Perception of Problems Highlighted for Solving and Innovating"	161
Authors Index	167

25th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2021)

Online
18 - 21 July 2021

Volume 2 of 3

Editors:

**Nagib Callaos
Natalja Lace**

**Belkis Sanchez
Michael Savoie**

ISBN: 978-1-7138-3519-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2021) by International Institute of Informatics and Systemics (IIIS)
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact International Institute of Informatics and Systemics (IIIS)
at the address below.

International Institute of Informatics and Systemics (IIIS)
13750 West Colonial Dr.
Suite 350-408
Winter Garden, Florida 34787
USA

Contact-us@iiis.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Volume II

Table of Contents	i
Case Studies and Methods	
Gotsev, Lyubomir; Dimitrova, Milena; Jekov, Boyan; Kovatcheva, Eugenia; Shoikova, Elena (Bulgaria): "A Cybersecurity Data Science Demonstrator: Machine Learning in IoT Network Security"	1
Kopishynska, Olena; Utkin, Yurii; Galych, Oleksandr; Makhmudov, Hanlar; Svitlychna, Alla; Lyashenko, Viktor (Ukraine): "Features of the Case Method Application in the Study of Disciplines Related to Information Technologies and IT Project Management"	7
Nikolarea, Ekaterini (Greece): "Human Intelligence (HI –Nous) and Artificial Intelligence (AI) In ESP/EAP Teaching and Editing of Inter-Disciplinary Research for International Communication – Case Studies and Methods"	13
Pons Murguía, Ramón A.; Villa González Del Pino, Eulalia M. (Ecuador): "Reduction of Workplace Accident Rates Using Mathematical Statistical Models"	20
Cybernetics and Philosophy	
Makhachashvili, Rusudan; Semenist, Ivan (Ukraine): "Linguistic Philosophy of Cyberspace"	24
Educational Research, Design, and Modeling	
Ilunga, Masengo (South Africa): "Analytic Hierarchy Process (AHP) for Evaluating Knowledge Areas of Advanced Diploma in Engineering Taught in South African Universities"	30
Ilunga, Masengo (South Africa): "An Assessment of Knowledge Areas for Advanced Diploma in Engineering Using Fuzzy Analytic Hierarchy Process (FAHP)"	34
Ilunga, Masengo (South Africa): "Assessing Knowledge Areas Consistency and Optimism Level for Advanced Diploma in Engineering Using Fuzzy Analytic Hierarchy Process (FAHP)"	39
Poszytek, Paweł; Fila, Jadwiga; Jeżowski, Mateusz (Poland): "The 4.0 Competences as Facilitators in the Realization, Management and Sustainability of Erasmus+ Projects in the Times of COVID-19 Pandemic"	44
Pournaghshband, Hassan; O'Dowd, Sean (USA): "Gamification Integration and Student Motivation: Issues and Concerns"	48

Scholl, Margit; Schuktomow, Regina; Gube, Stefanie (Germany): "Information Security in Pandemic Times – A Discussion Paper" 53

Interdisciplinary Research, Education, and Communication

Kvasnica, Peter (Slovakia): "The Block Algorithm Speed-up Computation of Aircrafts Mathematical Model and Simulation on CUDA Architecture" 60

Leka, Adrian (Albania): "Emergency Criminal Legislation in the Times of covid19: The Case of Albania" 65

Leune, Kees; Petrilli, Jr., Salvatore (USA): "Re-Envisioning a Computer Science Curriculum" 70

Marzullo, Rossella (Italy): "Education and Technology" 76

Siddique, Md Abu Bakkar (Japan): "The Effect of Financial Rent on Top 1% Income Ratio in Advanced Economies: An Evidence from Panel VAR Analysis" 79

Knowledge and Cognitive Science and Technologies

Carvalho, Mateus; Hayashi, Victor; Pinna, Felipe; Marquesone, Rosangela; Néto, João; Ruggiero, Wilson (Brazil): "Towards Modeling Semi-Automatic Ontology Based on Natural Language Processing" 85

Sanchis, Eric (France): "Free Will: A New Formulation" 91

Trans- and Inter-Disciplinary Research, Education, and Communication (TIDREC 2021)

Dixon, Steve (Singapore): "Discovering Patterns Across Disciplines: Cybernetics, Existentialism and Contemporary Art" 97

Esparza, Norma; Restrepo, Dayana; Guerrero, María C.; Hoyos, Olga (Colombia): "Interdisciplinarity in the Construction of a Videogame as an Intervention Tool in School Conflict" 103

Fernández de Velazco, Fuensanta; Carpinteyro-Lara, Eduardo; Rodríguez-Luna, Saúl (Mexico): "Creation of a Computational Model from the Perspective of the Functional-Structural Theory of Talcott Parsons – Case Study: The Emergence of the Mexican Bolero" 107

Kopishynska, Olena; Utkin, Yurii; Lyashenko, Viktor; Barabolia, Olha; Kalashnik, Olena; Mororz, Svitlana; Kartashova, Olga (Ukraine): "Information Systems and Technologies in Agronomy and Business: Employers' Requirements-Oriented Study in Agricultural Universities" 113

Manciaracina, Andrea Giuseppe (Italy): "Educational Technologies for Hybrid Learning Contexts: A Grid of 12 Technological Communication Tools" 119

Poszytek, Paweł (Poland): "Interdisciplinarity as a Key Competence on Industry 4.0 Labor Market" 125

Qiao, Zhilei; Julio C., Rivera (USA): "Towards a Framework for Assessing Cybersecurity Risks in Internet of Things (IOT) Devices"	128
Restrepo Cervantes, Dayana; Marenco-Escuderos, Ailed Daniela; Rambal Rivaldo, Laura Isabel (Colombia): "Resilience Profiles Associated with Social Support and Engagement for Overcoming Academic Obstacles in Undergraduate Education"	134
Tortoriello, Francesco Saverio; Veronesi, Ilaria (Italy): ""Historical Path in Mathematical Games": A Didactic Laboratory Activity Dedicated to Upper Secondary School Students"	138
Tudose, Cătălin (Romania): "Agile Software Development and War Strategies"	142
Widiasih, Esther; Garrido, Xavier; Johnson, Tanner; Kupihea, Kehaulani (USA): "A Hawaiian Fishpond as an Educational Interdisciplinary Nexus"	148
Wu, Yung-Gi; Jin, Zi-En; Lin, Chia-Liang (Taiwan): "Emotion Detection by Speech and Voice Tone"	152
Invited Paper(s) associated to Plenary Keynote Addresses	
Hashimoto, Shigehiro (Japan): "Interdisciplinary Background Helps Communication in Pandemic: Learning Multidisciplinary Field of Biomedical Engineering" (Invited Paper)	158
Makhachashvili, Rusudan; Semenist, Ivan (Ukraine): "Interdisciplinary Trends of Digital Education in the COVID-19 Paradigm: Global Event Horizon" (Invited Paper)	164
Authors Index	173

25th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2021)

Online
18 - 21 July 2021

Volume 3 of 3

Editors:

**Nagib Callaos
Natalja Lace**

**Belkis Sanchez
Michael Savoie**

ISBN: 978-1-7138-3519-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2021) by International Institute of Informatics and Systemics (IIS)
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact International Institute of Informatics and Systemics (IIS)
at the address below.

International Institute of Informatics and Systemics (IIS)
13750 West Colonial Dr.
Suite 350-408
Winter Garden, Florida 34787
USA

Contact-us@iis.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Volume III

Table of Contents	i
Applications of Informatics and Cybernetics in Science and Engineering	
Batthula, Venkata Jaipal Reddy; Segall, Richard S.; Howell, Michael; Aboudja, Hyacinthe; Berleant, Daniel; Tsai, Peng-Hung (USA): "Forecasting of a Technology Using Quantitative Satellite Lifetime Data"	1
Chae, Haeng-Suk (South Korea): "Interactive Effects of Object Transfer Between Application Windows Displayed"	7
Ramachandran, Anita; Pant, Atul Kumar; Karuppiyah, Anupama (India): "Performance Analysis of Machine Learning Algorithms for Sleep Apnea Detection using ECG"	11
Sadilek, Marek; Cep, Robert; Cepova, Lenka; Kusnir, Lukas; Sniehotta, Patrik (Czech Republic): "The Tool Path Tolerance Setting with Respect to Accuracy During 3axis Milling"	16
Yan, Pengyu *; Cai, Xiaoqiang *; Chu, Feng **; Ni, Debing * (* China, ** France): "A Reservation System with an Efficient Matching-and-Scheduling Mechanism for Private Parking-Sharing Programs"	22
Biomedical Engineering - Invited Session	
Organizers: Shigehiro Hashimoto and Hirotoshi Hishida (Japan)	
Hashimoto, Shigehiro; Ono, Ryuya (Japan): "Analysis of Dielectrophoretic Movement of Cell Flowing in Micro Channel Related to Shape of Cell"	25
Hashimoto, Shigehiro; Horiguchi, Fumiya; Yonezawa, Hiroki (Japan): "Cell Division Under Shear Stress Flow Field"	31
Hashimoto, Shigehiro; Matsumoto, Taketo; Uehara, Shogo (Japan): "How Does Cell Change Flow Direction in Micro Groove?"	37
Hashimoto, Shigehiro; Sekine, Wataru (Japan): "Does Direction of Tangential Force Field Affect Subsequent Behavior of Cells?"	43
Hishida, Hirotoshi; Komatsu, Yoshihiro; Hishida, Keiko; Yamamoto, Dai; Hishida, Yasuhiro (Japan): "Construction of a Music Database for Earphone Hearing Loss Prevention and Music Therapy - Discussions on the Relationship Between Beethoven's Music and His Deafness -"	49

Hishida, Hirotooshi; Watanabe, Tomoki; Fujii, Yamato; Hishida, Yasuhiro; Hishida, Keiko (Japan): "Basic Study on Evaluation of Earphone Hearing Loss - Discussion of Integration of Audiograms -"	55
Hishida, Hirotooshi; Tang, Xinrui; Hishida, Yasuhiro (Japan): "Development of Turning Support Jig for Elderly People"	60
Hishida, Hirotooshi; Fujii, Yamato; Kawano, Atsushi; Hishida, Keiko; Hishida, Yasuhiro (Japan): "Basic Study on the Mechanism of Earphone Hearing Loss - Further Experiment Obtaining Ear Age and Real Age -"	63
Hishida, Hirotooshi; Komatsu, Yoshihiro; Hishida, Yasuhiro; Sugimoto, Manaka (Japan): "Basic Study on the Recognition of Line Thickness - Proposal of Experimental Method and Presentation of Its Results -"	67
Uehara, Shogo; Hashimoto, Shigehiro (Japan): "How Does Cell Deform During Movement in Micro Gap?"	72
Yonezawa, Hiroki; Hashimoto, Shigehiro; Ono, Ryuya (Japan): "Can Cell Type Be Distinguished by Behavior in Shear Stress Field?"	78

Control, Communication and Network Systems, Technologies and Applications

Calderón Ch., J. Alan; Lozano, John; Tafur, Julio; Barriga, Benjamín; Lengua, Juan Carlos; Solano, Gonzalo; Huanca, Darío (Peru): "Optimal Analysis for Enhancement of Thermo Mechatronic Processes"	84
Corbera, Jefferson; Guillén, Fabricio; De La Cruz, Mario; Kemper, Guillermo; Oviden, José (Peru): "An Automatic Equipment for the Marking of 12" Polyethylene Pipes"	90
Narita, Yuma; Lu, Shan; Kamabe, Hiroshi (Japan): "Access Point Placement for Indoor Wireless LAN"	96

Innovation and Technology Transfer in Emerging Economies - Invited Session

Organizers: Elina Gaile-Sarkane and Inga Lapina (Latvia)

Čevers, Aldis; Gaile-Sarkane, Elīna (Latvia): "Different Approaches to the Development of Customs Work and Process Evaluation System"	101
Čevers, Aldis; Rudzītis, Normunds; Gulbis, Aivars (Latvia): "Facilitation of Legal Trade: Implementation of AEO"	107
Citskovskis, Ugis (Latvia): "Conflict Management for Improvement of Processes in Organizations"	113
Ence, Enno; Gaile-Sarkane, Elīna; Štrausa, Evita (Latvia): "Values Based Positioning – The Key to Success in Development of a Brand"	117

Gaile-Sarkane, Elina *; Segers, Jean-Pierre *; Franco, Dirk V. **; Van Caillie, Didier **; Macke, Janaina *** (* Latvia, ** Belgium, *** Brazil): "Holistic Approach to Innovation Projects: The Perspective of Higher Educational Institutions"	123
Jankovska, Ilze; Gaile-Sarkane, Elina (Latvia): "Self-Definition of Virtual Identity: Post COVID-19 Consumer in Details"	128
Kokins, Gundars; Straujuma, Anita (Latvia): "Developing a Customer Centric Journey Map"	134
Lapina, Inga; Briede, Ieva; Aramina, Daira (Latvia): "Interrelation of Process Management and Employee Stressors in Organization"	140
Millers, Maris; Gaile-Sarkane, Elina (Latvia): "Comparison of Governance Cases in Owner-Managed SMEs"	146
Rivera, Claudio A.; Bancroft, Justin (Latvia): "Enhancing an Interdisciplinary Program with Blended Learning – The Case of the Baltic IT Leadership Program"	151
Sceulovs, Deniss; Balaji, Ragav Abishek; Babica, Viktorija; Rustenova, Elvira; Sprogis, Maris (Latvia): "Identification of Cultural Determinants for International Business"	154
Authors Index	161