

# **2020 11th International Conference on Information, Intelligence, Systems and Applications (IISA 2020)**

**Piraeus, Greece  
15 – 17 July 2020**



**IEEE Catalog Number: CFP2034V-POD  
ISBN: 978-1-6654-2229-1**

**Copyright © 2020 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:	CFP2034V-POD
ISBN (Print-On-Demand):	978-1-6654-2229-1
ISBN (Online):	978-1-6654-2228-4

**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

2020 11th International Conference on Information, Intelligence, Systems and Applications  
(IISA)

Table of Contents

Full papers

<b>Effects of Cycle Evaluation on Peer Learning: Competency Assessment, Case Study, Catholic University of Temuco, Chile.....</b>	<b>1</b>
<i>Marcos Levano</i>	
<b>Digital game-based learning in a robotics course.....</b>	<b>7</b>
<i>Marcio Mendonca, Elpiniki Papageorgiou, Lucas Botoni de Souza, Diene Eire de Mello, Jose Augusto Fabri</i>	
<b>Investigating the role of STE(A)M Educators: a case study in Greece.....</b>	<b>14</b>
<i>Natalia Spyropoulou, Achilles Kameas</i>	
<b>Local Manifold Regularization for Knowledge Transfer in Convolutional Neural Networks</b>	<b>20</b>
<i>Ilias Theodorakopoulos, Foteini Fotopoulou, George Economou</i>	
<b>Applying a Convolutional Neural Network in an IoT Robotic System for Plant Disease Diagnosis .....</b>	<b>28</b>
<i>Apostolos Xenakis, Georgios Papastergiou, Vassilis C. Gerogiannis, George Stamoulis</i>	
<b>Customization of self-regulation in the use of ICT for the learning process with continuous improvement: Catholic University of Temuco, Chile .....</b>	<b>36</b>
<i>Marcos Levano</i>	
<b>Intelligent System for Detection of Wild Animals Using HOG and CNN in Automobile Applications.....</b>	<b>43</b>
<i>Yuvaraj Munian, Miltiadis Alamaniotis, Antonio Martinez-Molina</i>	
<b>Securing Access to Healthcare Data with Context-aware Policies.....</b>	<b>51</b>
<i>Evgenia Psarra, Ioannis Patiniotakis, Yiannis Verginadis, Dimitris Apostolou, Gregoris Mentzas</i>	
<b>Applying Cloud Based Machine Learning on Biosensors Streaming Data for Health Status Prediction .....</b>	<b>57</b>
<i>Ahmed Ismail, Samir Abdelrazek, Ibrahim Elhenawy</i>	
<b>MADM System for the Development of Adaptable Mobile Applications for People with Intellectual Disabilities.....</b>	<b>65</b>
<i>Olga Shabalina, Vladislav Guriev, Stanislav Kosykov, Nikita Dmitriev, Aleksandr Davtian</i>	
<b>Sports Analytics for Football League Table and Player Performance Prediction.....</b>	<b>73</b>
<i>Victor Chazan – Pantzalis, Christos Tjortjis</i>	
<b>A Storage as a Service scheme for supporting Medical Services on 5G Vehicular Networks.....</b>	<b>81</b>
<i>Eirini Zoumi, Emmanouil Skondras, Nikolaos Tsolis, Angelos Michalas, Dimitrios D. Vergados</i>	

<b>Transient Stability Analysis in Power Systems Integrated with a Doubly-Fed Induction Generator Wind Farm .....</b>	<b>87</b>
<i>Michail Katsivelakis, Dimitrios Bargiotas, Aspasia Daskalopulu</i>	
<b>Hybrid No-Reference Video Quality Models for H.264 with Encrypted Payload .....</b>	<b>94</b>
<i>Chulhee Lee</i>	
<b>How Guilty is a robot who kills other robots? .....</b>	<b>99</b>
<i>Oronzo Parlange, Stefano Guidi, Enrica Marchigiani, Paola Palmitesta, Alessandro Andreadis, Sergio Roncato</i>	
<b>Scalable Time Series Classification in streaming and batch environments on Apache Spark .....</b>	<b>104</b>
<i>Apostolos Glenis</i>	
<b>Analyzing ROADM costs in SDM networks .....</b>	<b>112</b>
<i>Charalampos Papapavlou, Konstantinos Paximadis, Giannis Tzimas</i>	
<b>CRNet Translator: Building GMA, S-System Models and Chemical Reaction Networks of Disease and Metabolic Pathways .....</b>	<b>119</b>
<i>Geoffrey Solano, Karen Fields, Angelyn Lao, Noel Fortun</i>	
<b>PlaPhy-SMD: A Database System of Plants and their Phytochemicals Integrated with Small-Molecule Drugs and their Condition and Gene Associations with Clustering and Product Ingredient Matching.....</b>	<b>127</b>
<i>Geoffrey Solano, Jazmine Mae Recario, Angelyn Lao</i>	
<b>Big Data Mining for Smart Cities: Predicting Traffic Congestion using Classification.....</b>	<b>135</b>
<i>Aristeidis Mystakidis, Christos Tjortjis</i>	
<b>Elastic Distributed Rendering Service Placement in Capacitated Cloud/Fog Gaming Systems .....</b>	<b>143</b>
<i>Athanasios Tsipis, Vasileios Komianos, Konstantinos Oikonomou, Ioannis Stavrakakis</i>	
<b>Intelligent Data Analytics from the Energy Economics of the Greek Debt Crisis .....</b>	<b>151</b>
<i>Maria Karasimou, Lefteri Tsoukalas, Vasileios Antonenas, Vasileios Laitos, Vasileios Polychronides</i>	
<b>Explainable Machine Learning applied to Single-Nucleotide Polymorphisms for Systemic Lupus Erythematosus Prediction .....</b>	<b>158</b>
<i>Geoffrey Solano, Marc Jermaine Pontiveros, Cherica Tee, Michael Tee</i>	
<b>A ZigBee - based Lightweight Wireless Sensor System for measuring action potential bio signals in Agriculture IoT Applications.....</b>	<b>166</b>
<i>Apostolos Xenakis, Konstantinos Kalovrektis, Antonios Gotsinas, Georgios Stamoulis</i>	

<b>Progress and Demonstrations on Space Division Multiplexing.....</b>	<b>173</b>
<i>Charalampos Papapavlou, Konstantinos Paximadis, Giannis Tzimas</i>	
<b>Effects of Lighting Variations in Virtual Learning Environments .....</b>	<b>181</b>
<i>Anna-Maria Velentza, Elias Economou</i>	
<b>Vision-based navigation for autonomous space rendezvous with non-cooperative targets.....</b>	<b>187</b>
<i>Anthea Comellini, Emmanuel Zenou, Christine Espinosa, Vincent Dubanchet</i>	
<b>Development of Convolutional Neural Network-based models for bone metastasis classification in nuclear medicine .....</b>	<b>195</b>
<i>Nikolaos Papandrianos, Elpiniki Papageorgiou, Athanasios Anagnostis, Konstantinos Papageorgiou, Anna Feleki</i>	
<b>Towards a methodology to conceptualize the EU-funded projects impact on cultural sector .....</b>	<b>203</b>
<i>Danai Katsanta, Dimitrios Tsolis</i>	
<b>A Sentiment-based Hotel Review Summarization using LSTM Neural Networks.....</b>	<b>209</b>
<i>Agorakis Bompotas, Aristidis Ilias, Maria Adamopoulos, Andreas Kanavos, Christos Makris, Gerasimos Rompolas, Alkiviadis Savvopoulos</i>	
<b>Smart eGov Services for Citizenship: Improving Personalized Services .....</b>	<b>216</b>
<i>Stavros Pliotopoulos, Evangelos Sakkopoulos</i>	
<b>Advanced Fuzzy Cognitive Maps Modelling a Nearly Zero Energy Building .....</b>	<b>224</b>
<i>Eleni Vergini, Peter Groumpos</i>	
<b>Real-Time Adaptive Noise and Echo Cancellation on a Compact Microcontroller .....</b>	<b>229</b>
<i>Andreas Spanias, Joshua Vandermeer,, Frank Giuliani, Erica Low, Katherine Thomasson</i>	
<b>Decision Support Tools for Energy Efficiency Obligated Parties towards Energy Poverty Alleviation .....</b>	<b>234</b>
<i>Apostolos Arsenopoulos, Vangelis Marinakis, Konstantinos Koasidis, Andriana Stavrakaki, John Psarras</i>	
<b>Prediction of pain in knee osteoarthritis patients using machine learning: Data from Osteoarthritis Initiative.....</b>	<b>240</b>
<i>Antonios Alexos, Christos Kokkotis, Serafeim Moustakidis, Elpiniki Papageorgiou, Dimitrios Tsaopoulos</i>	
<b>A Machine Learning workflow for Diagnosis of Knee Osteoarthritis with a focus on post-hoc explainability .....</b>	<b>247</b>
<i>Christos Kokkotis, Serafeim Moustakidis, Elpiniki Papageorgiou, Giannis Giakas, Dimitrios Tsaopoulos</i>	
<b>Deep Learning on the Web: State-of-the-art Object Detection using Web-based Client-side Frameworks.....</b>	<b>254</b>
<i>Dimitrios Koutsomitropoulos, Xenofon Pournaras</i>	
<b>Web-based Application for Screening Energy Efficiency Investments: A MCDA Approach</b>	<b>262</b>
<i>Aikaterini Papapostolou, Filippos Dimitrios Mexis, Elissaios Sarmas, Charikleia Karakosta, John Psarras</i>	
<b>Developing a software-based platform for strengthening public participation in Greece.....</b>	<b>269</b>
<i>Apostolos Arsenopoulos, Nikolaos Mastromichalakis, John Psarras</i>	

<b>Intelligent Nature-Inspired Approaches for Optimal Resource Levelling in a High Voltage Alternating Current Submarine Link Terminal Station Project .....</b>	<b>275</b>
<i>Georgios Dounias, Alexandros Tzanetos, Dimitrios Ntardas</i>	
<b>Health Monitoring of People with Diabetes using IoT and 5G Wireless Network Infrastructures .....</b>	<b>281</b>
<i>Vasileios Tsoulchas, Nikolaos Tsolis, Eirini Zoumi, Emmanouil Skondras, Dimitrios D. Vergados</i>	
<b>New Advanced Technology Methods for Energy Efficiency of Buildings .....</b>	<b>287</b>
<i>Peter Groumpos, Vassiliki Mpelogianni</i>	
<b>A traceability and auditing framework for electronic equipment reverse logistics based on blockchain: the case of mobile phones .....</b>	<b>295</b>
<i>Thomas K. Dasaklis, Fran Casino, Constantinos Patsakis</i>	
<b>Deep Learning Methods in Medical Imaging for the Recognition of Breast Cancer.....</b>	<b>302</b>
<i>Ioannis Daramouskas, Antonios Matzakos Chorianopoulos, Foteini Grivokostopoulou, Isidoros Perikos, Ioannis Hatzilygeroudis</i>	
<b>Eye Gaze Analysis of Learners in Educational Systems .....</b>	<b>310</b>
<i>Panteleimon-Evangelos Aivaliotis, Foteini Grivokostopoulou, Ioannis Daramouskas, Isidoros Perikos, Ioannis Hatzilygeroudis</i>	
<b>A new Mathematical Modell for COVID-19: A Fuzzy Cognitive Map Approach for Coronavirus Diseases .....</b>	<b>316</b>
<i>Peter Groumpos</i>	
<b>IRES Program in Sensors and Machine Learning for Energy Systems .....</b>	<b>324</b>
<i>Andreas Spanias, Kristen Jaskie, Sunil Rao, Wendy Barnard, Photini Spanias, Elias Kyriakides, Maria Michael, Yiannis Tofis, Lenos Hadjidemetriou, Theo Theocharides, Stella Hadjistassou</i>	
<b>Excavations go mobile: A web-based mobile application for archaeological excavations.....</b>	<b>329</b>
<i>Alexandros-Stavros Karabinakis, Georgios Styliaras, Nikolaos Avouris</i>	
<b>Fuzzy states for dynamic adaptation of the plot of an educational game in relation to the learner's progress .....</b>	<b>337</b>
<i>Konstantina Chrysafiadi, Spyros Papadimitriou, Maria Virvou</i>	
<b>HappyCruise: An architecture for Personalized Secure Boarding on Cruises .....</b>	<b>344</b>
<i>Evangelos Sakkopoulos, Giannis Tzimas, George Pavlidis, Zafeiria-Marina Ioannou, Emmanouil Viennas</i>	
<b>Machine Learning Workforce Development Programs on Health and COVID-19 Research.....</b>	<b>352</b>
<i>Andreas Spanias</i>	
<b>Capital Structure Determinants And Speed Of Adjustment In Us (including cultural industries). A Quantile Regression Approach .....</b>	<b>356</b>
<i>Andreas Kaloudis, Theodore Koutsobinas, Dimitrios Tsolis</i>	
<b>Distance Education Gamification in Social Virtual Reality: A Case Study on Student Engagement.....</b>	<b>365</b>
<i>Stylianos Mystakidis</i>	

<b>802.15.4 - based Efficient Wireless Sensor System Design for Monitoring Blood Oxygen and Heart Rate in IoT Medical Applications .....</b>	<b>371</b>
<i>Apostolos Xenakis, Konstantinos Kalovrektis, Antonios Gotzinas, Ioannis Korinthios, Georgios Stamoulis</i>	
<b>Predicting students' final test results based on previous grades and demographics .....</b>	<b>377</b>
<i>Avar Pantel, Lisanne-Liis Kaiva</i>	
<b>A Neural Network approach for Non-parametric Performance Assessment .....</b>	<b>383</b>
<i>Dionisios Sotiropoulos, Gregory Koronakos</i>	
<b>Synchronous and Asynchronous Learning Methods under the light of General Data Protection Regulation .....</b>	<b>391</b>
<i>Eirini Mouggiakou, Spyros Papadimitriou, Maria Virvou</i>	
<b>Evaluation of the perception of teachers for ICT and cultural mobile apps in education .....</b>	<b>398</b>
<i>Athanasia Alexandri, Christos Alexakos, Apostolos Terzoglou, Andreas Athanitis, Dimitrios Tsolis</i>	
<b>Measuring the Quality of Street Surfaces in Smart Cities through Smartphone Crowdsensing .....</b>	<b>403</b>
<i>Efthimios Alepis, Constantinos Patsakis, Effrosyni Sigala</i>	
<b>A research in the design of augmented reality gamified mobile applications for promoting traditional products implemented in ambient intelligence environment of small shops.....</b>	<b>411</b>
<i>Konstantinos I. Kotsopoulos, Alexandros Papadopoulos, Anastasios Babathanasis, Stelios Axiotopoulos</i>	
<b>Association Rules and Machine Learning for Enhancing Undeclared Work Detection .....</b>	<b>419</b>
<i>Eleni Alogogianni, Maria Virvou</i>	
<b>Augmented Reality applications in Cultural Heritage: Technology or Content? .....</b>	<b>427</b>
<i>Stavroula Tzima, Georgios Styliaras, Athanassios Bassounas</i>	
<b>Analysis and Design of Services in Building Units in the context of a Smart City .....</b>	<b>435</b>
<i>Dimitrios D. Vergados, Konstantina Siountri, Vassilios Matsouliadis</i>	

## Short papers

<b>Color Lane Line Detection Using the Bhattacharyya Distance.....</b>	<b>441</b>
<i>Jaeho Han, Chulhee Lee</i>	
<b>Deep learning networks for vectorized energy load forecasting.....</b>	<b>445</b>
<i>Kristen Jaskie, Dominique Smith, Andreas Spanias</i>	
<b>Theoretical Foundations of Virtual and Augmented Reality-Supported Learning Analytics.....</b>	<b>452</b>
<i>Athanasios Christopoulos, Nikolaos Pellas</i>	
<b>A Methodology For Drones to Learn How to Navigate And Avoid Obstacles Using Decision Trees .....</b>	<b>456</b>
<i>Isidoros Perikos, Ioannis Daramouskas, Ioannis Hatzilygeroudis, Vaios Lappas, Vasilios Kostopoulos</i>	
<b>Critical Systems under Cyber Threats .....</b>	<b>460</b>
<i>Styliani Pantopoulou, Pola Lydia Lagari, Clive H. Townsend, Lefteri H. Tsoukalas</i>	
<b>Proactive Building Energy Management Methods based on Fuzzy Logic and Expert Intelligence.....</b>	<b>464</b>
<i>Vassiliki Mpelogianni, Peter Groumpos, Dimitris Tsipianitis</i>	
<b>A Virtual Reality Platform for Learning Aspects of Entrepreneurship .....</b>	<b>468</b>
<i>Isidoros Perikos, Konstantinos Kovas, Foteini Grivokostopoulou, Ioannis Hatzilygeroudis</i>	
<b>Switching angles calculation through Mathematical Optimization in Multilevel Inverters.</b>	<b>472</b>
<i>Ioannis Batsis, Dimitrios Bargiotas, Aspasia Daskalopulu</i>	
<b>Comparative Energy Information Analytics of Five European Economies .....</b>	<b>476</b>
<i>Maria Karasimou, Lefteri Tsoukalas, Vasileios Antonenas, Vasileios Laitzos, Vasileios Polychronides</i>	
<b>A Theoretical Persuasive Framework for Supporting and Evolving an Individual's Sustainable Mobile Traveling Attitude.....</b>	<b>480</b>
<i>Maria Eftychia Angelaki, Theodoros Karvounidis, Christos Douligeris</i>	
<b>A Smart Cablebot for Spectral Imaging and Micro-climate measurements inside Greenhouses.....</b>	<b>484</b>
<i>Dimitris Tsipianitis, Dionysios Bitas, Kyriakos Papastavros</i>	
<b>Group Affect Recognition: Facial Features Extraction via Color Inverted Points.....</b>	<b>488</b>
<i>Andreas M. Triantafyllou, George A. Tsihrintzis</i>	