The 12th International Conference on Information, Intelligence, Systems and Applications
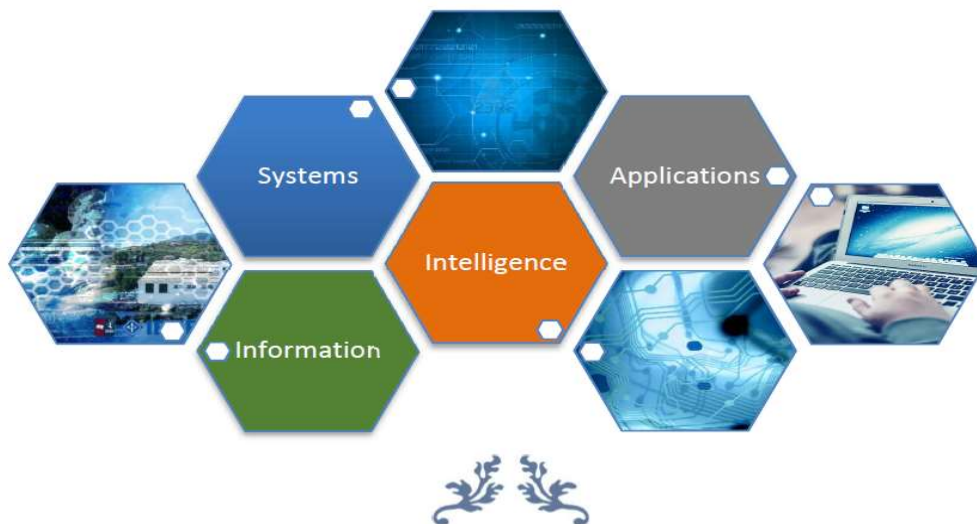
12-14 July 2021, Chania, Crete, Greece

https://easyconferences.eu/iisa2021/

The International Conference on Information, Intelligence, Systems and Applications (IISA) series offers a forum for the constructive interaction and prolific exchange of ideas among scientists and practitioners from different research fields – such as computers, mathematics, physics, biology, medicine, chemistry, experimental psychology, social sciences, linguistics, and engineering – having the goal of developing methodologies and tools for the solution of complex problems in artificial intelligence, biology, neuroscience, security, monitoring, surveillance, healthcare, sustainability in energy sources, governance, education, commerce, automation, robotics, optimization, image, speech and natural languages, and their integration.

Contents

IISA 2021 Chairs' Message

Welcome to the Twelfth International Conference on Information, Intelligence, Systems, and Applications (IISA 2021). **Information** is widely available and accessible, but frequently leads to information overload and overexposure, while the effort for coding, storing, hiding, securing, transmitting and retrieving it may be excessive. **Intelligence** is required to manage information and extract knowledge from it, inspired by biological and other paradigms. Information and **Multimedia Systems**, with an increasing level of Intelligence, are being developed that incorporate these advances. As a result, new Technologies, Protocols and **Applications** are emerging. The International Conference on Information, Intelligence, Systems and Applications (IISA) series offers a unique forum for the constructive interaction and prolific exchange of ideas among scientists and practitioners from different research fields – such as computers, mathematics, physics, biology, medicine, chemistry, experimental psychology, social sciences, linguistics, and engineering – having the goal of developing methodologies and tools for the solution of complex problems in artificial intelligence, biology, neuroscience, security, monitoring, surveillance, healthcare, sustainability in energy sources, governance, education, commerce, automation, robotics, optimization, image, speech and natural languages, and their integration.

The IISA conference is held on an annual basis and is intended as an international forum for researchers and professionals in all areas of Information, Intelligence, Systems and Applications. Every year, we invite submission of papers presenting high-quality original research and developments for the conference tracks. The IISA conference features tutorials, technical paper presentations, workshops, and distinguished keynote speeches.

This year's conference marks the twelfth IISA. IISA 2021 is organized by the University of Piraeus and the Hellenic Mediterranean University. IISA 2021 was originally planned to be a live conference with Chania, Crete, Greece as its venue. However, the COVID-19 pandemic and related travel restrictions and lockdowns forced us to hold IISA 2021 as a virtual/online conference. Despite the pandemic, IISA 2021 will last for three days and its technical program consists of eighteen (18) technical paper presentation sessions, one (1) tutorial session and three (3) keynote speeches. We received a significant number of high quality submissions. From them, sixty nine (69) were accepted as full (eight-page) papers and twenty (20) were accepted as short (four-page) papers. Moreover, accepted full and short papers were authored by authors-researchers from countries around the world, who represented academia, government, industry, and business.

In addition to the technical paper presentations and the keynote speeches, IISA 2021 features a Tutorial on ***Quantum Computing Algorithms for Machine Learning and Signal Processing***, organized and presented by Dr. Glen S. Uehara and Prof.-Dr. Andreas Spanias of Arizona State University, United States.

We are thankful to the many people who contributed to the success of IISA 2021. Firstly, thanks are due to the paper authors, including those whose papers were not accepted in the program, for choosing IISA 2021 as the forum for dissemination of the results of their research. We are also thankful to the IISA 2021 program committee members and reviewers for their wonderful work in reviewing and selecting in a timely manner the best among the submitted papers. Special thanks are due to the Sponsors of the conference for their financial sponsorship of IISA 2021. Thanks are also due to the University of Piraeus, the Hellenic Meditteranean University and IEEE for their technical co-sponsorship of the conference. For their actions to organize the conference, many thanks are due to the Local Organizing Chair:

Assist. Prof.-Dr. Dionisios Sotiropoulos, University of Piraeus, Greece,

as well as to the Publicity Chair:

Dr. Konstantina Chrysafiadi, University of Piraeus, Greece

Last, but not least, special thanks are due to the IISA 2021 coordinator, Easy Conferences Ltd., Cyprus.

On behalf of the 2021 International Conference on Information, Intelligence, Systems, and Applications, we invite all of you to join us virtually in Chania, Crete, Greece and enjoy the program.

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Prof.-Dr. Ioannis Hatzilygeroudis, University of Patras, Greece

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- Xenos Michalis, University of Patras, Greece
- Yamaguchi Takahira, Keio Univ, Japan
- Yamamoto Shuichiro, Nagoya University, Japan

Invited Keynote Speakers

Peter P. Groumpos

Title: **COVID-19 and the Big Data-driven World: Issues, Challenges and Opportunities**

Abstract:

COVID-19 has cast a nearly insufferable strain upon every aspect of our society, undoubtedly influencing for decades to come the way we will live, interact, date, make-build families, govern societies, attend church services and conduct business. In a time when agility and resilience are necessary norms, scientists, governments, businesses and companies that had already embraced data analytics found themselves positioned to combat the disease and its consequences with data. However, treating and analyzing data of any complex process is not a simple task. Data hide useful and valuable information. Data is widely available and accessible, but frequently leads to information overload and overexposure, while the effort for coding, storing, hiding, securing, transmitting and retrieving it may be excessive. Never before in human history has been such an information explosion. We could attribute this to the rise of smartphones, sensors, devices and connected vehicles and appliances, among other digital artifacts. Much of what we touch and work with now automatically generates data. Thus, the Big Data Driven World (BDDW) arises as a scientific area.

Perhaps the most dramatic outcome of the digital revolution is the amount of data now collected and analyzed. In 2010, the world created about two zettabytes (ZB) of digital information. That sounds impressive, until you consider that the World Economic Forum figured there were 45 ZB generated in 2020. Global companies estimate that the global datasphere will grow to 175 or even more by 2025. Nearly 30% of the world data will need real-time processing. COVID-19, affecting all facets of our lives, will be a big contributor to this data explosion. However, there is a very interesting and challenging question: Does *Data* equal *Information*? Furthermore, what do you do with unreliable and/or fake data?

In this keynote speech, this question is addressed. Emphasis is placed on Intelligence and Cognitive Systems. Intelligence is required to manage all available data and through existing methodologies to extract useful, valuable and reliable information. However, this is not sufficient. Cognitive systems create new knowledge using again new advanced methodologies (e.g., Artificial Intelligence, Machine Learning, Deep Learning, Fuzzy Logic, Cognition Reasoning). The paradigms of nature will be used extensively through consulting the best-known experts in each field. In this keynote speech, the challenge of the COVID-19 pandemic is analyzed through the prisma of the BDDW and all new technological advances. The need

to develop new multimedia systems, platforms and networks for COVID-19 are highlighted. Finally a conclusion is derived and will be stressed in this conference: **Data does _not_ equal Information**.

Bio:

Born in 1950, in Xylokastro, Corinth, Greece. In 1969, he went to the USA for his undergraduate and graduate studies. He received the following degrees from the SUNY at Buffalo all in Electrical Engineering: B.Sc. in 1974, a M.Sc. in 1976 and the Ph.D. in 1978. He worked at CALSPAN Corporation, as a researcher on space scientific problems, for a year, during 1978-79. In 1979, he went as a professor at the University of Cleveland, until 1988. He was vice president of the newly established Advanced Manufacturing Center in Cleveland (1985-1988). He created and directed the Energy Research Center (ERC) at CSU, 1983-1987. He developed and supervised the creation of the first world Stand-Alone Photovoltaic village in Schuchuli, in the Arizona desert, (USA), which provided all required energy needs for a village of 40 Indian families.

In 1989, he returned permanently to his homeland, Greece, as a full professor at the Department of Electrical Engineering and Computer Engineering (ECE) at the University of Patras. He retired in September of 2017. The department honored him immediately and made him an Emeritus Professor in October 2017.

In 1992, he established and developed (the first in Greece) Laboratory for Automation and Robotics (LAR) and served as its Director until Sept 2017. He served as a chairperson of the Department of ECE in the period 1999 – 2003 and as President & CEO, Patras Science Park, Patras, Greece during the period 2004–2010. He has been the Greek National representative to a number of high positions at European Management Committees (ESPRIT, ICT, IMS, INCO) and, also, to the EUREKA Program High Level Group (HLG) 1990-94 and 2004-10. He was the General Chairman of International Federation of Automatic Control (IFAC) Conferences, LSS '98 and MIM 2000, and of the IEEE Conferences, ISIC 2000 and MED 1994, 2000 and 2016. He was Program chairman of CIT&DS 2019 and 15th National and International _Conference HSSS_ 2019. He is one of the founders of the IEEE Controls System Magazine in 1984.

He has been teaching for more than 40 years (in the USA and Greece) undergraduate and graduate courses in the thematic areas of Automatic Control, Intelligent Systems, Robotics, Modeling Complex Dynamic Systems and Bioinformatics. His main research interests are: Modelling and Controlling Complex Dynamic Systems (CDS), Intelligent Control, Bioinformatics, Biomedical Engineering, Soft-computing techniques for CDS, Fuzzy Cognitive Maps (FCM), Cognitive Control, Knowledge Management, Simulation and Application of Informatics in the areas: Health, Energy and environment, Economics, Agriculture, Industry, International Relations and Social Studies. As Emeritus Professor, he is still teaching and conducting funded research. He has supervised more than 30 Doctoral and 150 Master theses.

He has numerous publications (over 380: 2 books, 10 edited books and conference proceedings, 14 invited chapters, international Journals, plenary papers, conferences and workshops papers) with more than 6200 citations on his research results and an h-index of

36. He is Member of Editorial boards for more than 6 International Journals. He has been Plenary-Keynote speaker on more than 30 international conferences the last 15 years.

He is married to Mrs. Alexandra Lotsari and father of 3 children.

Anthony Savidis

Title: **Back to the Internet of Things Future: When Everybody Crafts Personal Smart Automations**

Abstract:

The Internet of Things (IoT) opened huge opportunities for composition and coordination of smart device ecosystems in everyday tasks. But even after a decade of IoT entrance in the commercial scene, we still face solutions that are: monolithic closed-world ecosystems at a large or medium scale, with inflexible ready-made applications, usually offered by a few big manufacturers.

On the other hand, the needs for everyday automations are highly personalized in terms of when, how, why and what are such automations required. The latter has resulted in a market situation where, although various IoT technologies seem to rapidly proliferate, the available applications and automations for end-users best fitting their daily needs are very limited and restrictive, while lacking personalization and adaptation features. Thus, while everybody expected IoT to be the next big thing after smartphones, for individual consumers it remains a niche market.

We focus on a different approach, an alternative path for IoT evolution. Instead of treating people as buyers and consumers of ready-made solutions, we emphasize the provision of new type of tools so they can craft and test visually, easily, safely and even collaboratively, their own smart automations, following their own needs and preferences. We discuss recent advanced research in this direction and some key results we anticipate in the future.

Bio:

Anthony Savidis is a Full Professor at the Department of Computer Science, University of Crete and Affiliated Researcher at the Institute of Computer Science, FORTH with the HCI Laboratory. He holds a PhD from the University of Kent, UK (1999).

His research interests include: programming languages and software engineering, user-interface development tools, domain-specific tools, and interactive programming environments for learners. He participated in about 40 European and National R&D Projects, has more than 150 conference / journal / book publications (2600 citations and hIndex 30).

At the University of Crete, he was the former Director of the Centre of ICT, is twice elected Director of the Data Processing Laboratory of the School of Sciences and Engineering, and is an elected member of the Research Council. He has done pioneering work in user-interface management systems, scripting programming languages, adaptive interfaces, next generation IDEs and debuggers, accessible user-interface toolkits, and has developed one of the earliest

known software toolkits for the Internet of Things back in 2003 (as part of the Disappearing Computer 2WEAR European Research Project).

Nancy Alonistioti

Title: **5G and AI Revolutionizing Data Engineering and the Vertical Industries**

Abstract:

5G and AI are revolutionizing data engineering and the vertical industries, enabling new experiences, and transformative applications. The fundamental intelligence fused at the edge introduces a ubiquitous fabric of smart data-driven services. They will leverage on data from distributed systems with real-time capabilities. Significant amounts of data will be processed for intelligent application and networking purposes harnessing AI capabilities over low-latency 5G. AI is important for the support of SDN/NFV intelligence, as well as Software as a Service and Network as a service approaches for automation, softwarization, personalization, reliability and scaling intelligence.

Bio:

Assoc. Prof. Nancy Alonistioti is faculty member in Informatics and Telecommunications (Dept. of Informatics and Telecommunications, N. K. Uni. Of Athens). She has over 20 years of experience in numerous national and European projects, including project/technical management experience (e.g., MOBIVAS, ANWIRE, LIAISON, E2R I & II, E3, SelfNET, SACRA, CONSERN, UniverSelf, SmartAgriFood). She is currently leading the SCAN group activities and she is also Vice-Chair at the Dept. Informatics and Telecommunications in NKUA. She has served as member of the Future Internet Assembly Steering Committee. Recent activities and projects are in the areas of 5G (5GCroco, 5GROWTH etc….), 6G (RISE 6G) and European Digital Innovation Hubs (coordinator of LIVINGTRAC), Smart cities and Smart Maritime. She is member of the ETSI Experts group and the Greek standardization group ELOT (5G, smart city autonomic communications). She has over 150 publications in the area of mobile networks, NGI, SDN/NFV, IoT and AI, Smart City / Maritime applications, autonomic communications and reconfigurable mobile systems. She is co-author of 4 WO Patents and has more than 3000 citations.

Program at a Glance

Monday, 12 July 2021

08.45 – 09.00	**Opening Session** (ROOM-1)		
09.00 – 10.00	**Keynote Speech-1** (ROOM-1) **Anthony Savidis** **Back to the Internet of Things Future: When Everybody Crafts Personal Smart Automations**		
10.00 – 10.15	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
10.15 – 12.00	**MM-1**	**MM-2**	**MM-3**
12.00 – 12.30	*BREAK*		
12.30 – 14.15	**MA-1**	**MA-2**	**MA-3**

Tuesday, 13 July 2021

09.00 – 09.30	**Tutorial** (ROOM-1) **Glen S. Uehara and Andreas Spanias** **Quantum Computing Algorithms for Machine Learning and Signal Processing**		
09.30 – 09.45	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
09.45 – 11.30	**TM-1**	**TM-2**	**TM-3**
11.30 – 12.00	*BREAK*		
12.00 – 13.45	**TA-1**	**TA-2**	**TA-3**
13.45 – 14.00	*BREAK*		
14.00 – 15.00	**Keynote Speech-2** (ROOM-1) **Nancy Alonistioti** **5G and AI Revolutionizing Data Engineering and the Vertical Industries**		

Wednesday, 14 July 2021

09.00 – 10.00	**Keynote Speech-3** (ROOM-1) **Peter Groumpos** **COVID-19 and the Big Data Driven World: Issues, Challenges and Opportunities**		
10.00 – 10.15	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
10.15 – 12.00	**WM-1**	**WM-2**	**WM-3**
12.00 – 12.30	*BREAK*		
12.30 – 14.15	**WA-1**	**WA-2**	**WA-3**
14.15 – 14.30	**Closing Session** (ROOM-1)		

Detailed Program

Monday, 12 July 2021

08.45 – 09.00	**Opening Session** (ROOM-1) **Professor George A. Tsihrintzis**, University of Piraeus, Greece **Professor Maria Virvou**, University of Piraeus, Greece **Professor Ioannis Hatzilygeroudis**, University of Patras, Greece		
09.00 – 10.00	**Keynote Speech-1** (ROOM-1) **Anthony Savidis** **Back to the Internet of Things Future: When Everybody Crafts Personal Smart Automations**		
10.00 – 10.15	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
10.15 – 12.00	**MM-1** 9th International Workshop on Combinations of Intelligent Methods and Applications - I Session Chair: I. Hatzilygeroudis	**MM-2** Big Data Analytics in the Energy Sector Session Chair: H. Doukas	**MM-3** Educational Informatics - I Session Chair: Konstantina Chrysafiadi
10.15 – 10.35	**Exploring Aspects of Reasoning in Neuro-Symbolic Rules and Connectionist Expert Systems** Jim Prentzas, Ioannis Hatzilygeroudis	**Forecasting of short-term PV production in energy communities through Machine Learning and Deep Learning algorithms** Nikolaos Dimitropoulos, Nikolaos Sofias, Panagiotis Kapsalis, Zoi Mylona, Vangelis Marinakis, Niccolo Primo, Haris Doukas	**Evaluating the user experience of a fuzzy-based Intelligent Tutoring System** Konstantina Chrysafiadi, Maria Virvou
10.35 – 10.55	**Reasoning over Bayesian Networks using Semantic Artificial Neural Networks** Sotirios Batsakis, Grigoris Antoniou	**Data-driven applications to identify sustainable investment pathways in energy management and efficiency** Themistoklis Koutsellis, Vangelis Marinakis, Zoi Mylona, Aija Zučika, Haris Doukas	**A Scenario Editor to Create and Modify Virtual Simulations and Serious Games for Mental Health Education** Andrei Torres, Bill Kapralos, Celina Da Silva, Eva Hava Peisachovich, Adam Dubrowski
10.55 – 11.15	**Robustness of Compressed Deep Neural Networks with Adversarial Training** Yunchun Zhang,	**Innovative Personalised Applications to Motivate and Support Behavioural Energy Efficiency** Konstantinos Koasidis,	**Primary school teachers' attitudes towards digital educational games: Preliminary findings from the Multiplication Game**

	Chengjie Li, Wangwang Wang, Yuting Zhong, Xin Zhang, Yulin Zhang	John Psarras	**evaluation** Angeliki Leonardou, Maria Rigou, John Garofalakis
11.15 – 11.35	**Genetic Algorithm Based Quantum Circuits Optimization for Quantum Computing Simulation** Lu Wei, Zhong Ma	**A Data-Driven Decision Support Tool at the service of Energy suppliers and Utilities for Tackling Energy Poverty: A case study in Greece** Apostolos Arsenopoulos, Elissaios Sarmas, Andriana Stavrakaki, Ioanna Giannouli, John Psarras	**Develop a Virtual Reality Simulation Environment for Training Purposes** Jeries Besharat, Mpesiana Tzani, Vlasis Charalampous, Chrysostomos Stylios, George Papantzikos
11.35 – 11.55	**Differentially Private Synthetic Mixed-Type Data Generation For Unsupervised Learning** Uthaipon Tao Tantipongpipat, Chris Waites, Digvijay Boob, Amaresh Ankit Siva, Rachel Cummings	**Integrating Integrated Assessment Modelling in Support of the Paris Agreement: The I2AM PARIS Platform** Alexandros Nikas, Stavros Skalidakis, Alevgul Sorman, Ester Galende-Sanchez, Konstantinos Koasidis, Filippos Serepas, Dirk-Jan Van de Ven, Jorge Moreno, Anastasios Karamaneas, Themistoklis Koutsellis, Eleni Kanellou, Haris Doukas	**Formative Evaluation for Intelligence Quality Management in an Education Program. Case Study.** Dimitris Tsipianitis, Ifigeneia Roumelioti
12.00 – 12.30	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
12.30 – 14.15	**MA-1** 9th International Workshop on Combinations of Intelligent Methods and Applications - II Session Chair: I. Perikos	**MA-2** 6th International Workshop on Mobile Hypermedia Applications for Culture Session Chairs: G. Styliaras and D. Tsolis	**MA-3** Educational informatics - II Session Chair: E. Sakkopoulos
12.30 – 12.50	**Fuzzy Integration of kernel-based Gaussian Processes applied to Anomaly Detection in Nuclear Security** Miltos Alamaniotis	**Attempting to reconstruct a 3D indoor space scene with a mobile device using ARCore** Dimitrios Tsoukalos, Vangelis Drosos,	**Personalized Academic Thesis Management** Eythymios Tsatsaris, Evangelos Sakkopoulos

		Dimitrios Tsolis	
12.50 – 13.10	**Optimization of motion and energy consumption of an industrial automated ground vehicle** Theodora Liangou, Argyris Dentsoras	**Motivating Item Annotations In Cultural Portals With UI/UX Based On Behavioral Economics** Georgios Drakopoulos, Yorghos Voutos, Phivos Mylonas, Spyros Sioutas	**Automatic Generation of Tutorial Systems on PC for Smartphone Applications** Sixin Hua, Yoshiaki Fukazawa
13.10 – 13.30	**Google Stock Trend Prediction Based on RNNs and Twitter** Stefanos Agathonos, Thomas Amorgianiotis, Spiridon Likothanassis	**Combining 3D Surveying with Archaeological Uncertainty: the metopes of the Athenian Treasury at Delphi** Katerina Mania, Athanasia Psalti, Dimitra-Maria Lala, Marilena Tsakoumaki, Andreas Polychronakis, Anastasia Rempoulaki, Michael Xinogalos, Emmanuel Maravelakis	**A Teaching Assistant for Microelectronic Circuits Problems** Salam Nachawi, Vincent Gaudet, Mohamed Elmasry
13.30 – 13.50	**Exploring the Effectiveness of Employing Limited Resources for Deep Neural Pairwise Evaluation of Machine Translation** Despoina Mouratidis, Katia Lida Kermanidis	**Aspect-Based Community Detection of Cultural Heritage Streaming Data** Elias Dritsas, Maria Trigka, Gerasimos Vonitsanos, Andreas Kanavos, Phivos Mylonas	**Optimal Team Pairing of Elder Office Employees with Machine Learning on Synthetic Data** Elias Dritsas, Nikos Fazakis, Otilia Kocsis, Konstantinos Moustakas, Nikos Fakotakis
13.50 – 14.10	**CNN-based affective states recognition in ambulatory settings** Leonidas Liakopoulos, Nikolaos Stagakis, Evangelia I. Zacharaki, Konstantinos Moustakas	**Preliminary research on the design of an ambient intelligence application utilizing the exploitation of landmarks for the promotion of ancient greek technology exhibits.** Konstantinos Kotsopoulos, Konstantinos G. Kotsanas, Asimina N. Mitsomponou, Theofanis Alexandridis	**How Camera Placement Affects Gameplay in Video Games** Markos Naftis, Georgios Tsatiris, Kostas Karpouzis

Tuesday, 13 July 2021

	ROOM-1	ROOM-2	ROOM-3
09.00 – 09.30	**Tutorial** (ROOM-1) **Glen S. Uehara and Andreas Spanias** **Quantum Computing Algorithms for Machine Learning and Signal Processing**		
09.30 – 09.45	*BREAK*		
	ROOM-1	**ROOM-2**	**ROOM-3**
09.45 – 11.30	**TM-1** Healthcare Session Chair: P. Groumpos	**TM-2** Smart Energy Session Chair: D. Tsipianitis	**TM-3** Networks Session Chair: E. Skondras
09.45 – 10.05	**Tackling Covid-19 Using New Scientific Theories: The Artificial Intelligence Case** Peter Groumpos	**New Advanced Intelligent Technologies for Energy Savings in Commercial Buildings.** Vassiliki Mpelogianni, Peter Groumpos, Dimitris Tsipianitis, konstantinos Gkountas, Aimilia Papagiannaki, John Gionas	**A Network Slicing Algorithm for 5G Vehicular Networks** Emmanouil Skondras, Angelos Michalas, Dimitrios J. Vergados, Emmanouel T. Michailidis, Nikolaos I. Miridakis
10.05 – 10.25	**Enhancing the accessibility of Serious Games: A case study with Foodbot Factory** Robert Savaglio, Jacqueline M. Brown, Bill Kapralos, Ann LeSage, Beatriz Franco Arellano, Janette Hughes, JoAnne Arcand	**Expert Intelligence Tools for Proactive Energy Management in Buildings** Dimitris Tsipianitis, Peter Groumpos, Stefanos Michos	**An AI-based Prediction-as-a-Service Model for Estimating Machine Bearing Health Status in Industry 4.0 5G Applications** Dimitrios Batistakis, Apostolos Xenakis, Georgios Papastergiou, Periklis Chatzimisios, Vassilis Gerogiannis
10.25 – 10.45	**Deep Learning for Bone Metastasis Localisation in Nuclear Imaging data of Breast Cancer Patients** Serafeim Moustakidis, Athanasios Siouras, Nikolaos Papandrianos, Charis Ntakolia, Elpiniki Papageorgiou	**Quantum Neural Network Parameter Estimation for PV Fault Detection** Glen Uehara, Sunil Rao, Matthew Dobson, Cihan Tepedelenlioglu, Andreas Spanias	**Optical Frequency Hopping Techniques for Secure Fiber-Optic networks** Charalampos Papapavlou, Konstantinos Paximadis, Giannis Tzimas, Ioanna Savelona
10.45 – 11.05	**VRESS: Designing a platform for the development of personalized Virtual**	**PV Array Soiling Detection using Machine Learning** Joshua Martin, Kristen	**Design and Analysis of a New SDM Submarine Optical Network for Greece**

	Reality scenarios to support individuals with Autism Konstantinos Kotsopoulos, Matthaios Katsounas, Alexandros Sofios, Christos Skaloumbakas, Alexandros Papadopoulos, Athanassios Kanellopoulos	Jaskie, Yiannis Tofis, Andreas Spanias	Charalampos Papapavlou, Konstantinos Paximadis, Giannis Tzimas
11.05 – 11.25	**Classification of Medical Big-Data collected using IoT Devices** Eirini Zoumi, Emmanouil Skondras, Angelos Michalas, Dimitrios D. Vergados	**Renewable Energy Sources and Impact on GDP Growth** Maria Karasimou, Olga Mousiari, Lefteris H. Tsoukalas	**Near-Far Problem as a Function of Analog to Digital Converter Resolution in Software Defined Radio Tactical Network** Kashif Shahzad, Muhammad Zeeshan, Muhammad Umar Farooq, Shoab Ahmed Khan
11.30 – 12.00	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
12.00 – 13.45	**TA-1** Computer Vision and Robotics Session Chair: D. Tsipianitis	**TA-2** Smart Applications Session Chair: A. Kanavos	**TA-3** Other Papers Session Chair: L. Tsoukalas
12.00 – 12.20	**Development of an Integrated Three-Devices Robotic System for Green House Control** Dimitris Tsipianitis, Vasileios Thomopoulos, Angeliki Kavga, Kyriakos Papastavros, Dionysios Bitas, Peter Groumpos	**Smart Cities and Intelligent Transportation inTraditional Cities. Ten Design Principles and One Case Study.** Sotiris Lycourghiotis, Vassiliki Mpelogianni, Peter Groumpos	**Secure Decision Making and Inference in Critical Systems** Styliani Pantopoulou, Maria Pantopoulou, Lefteri H. Tsoukalas
12.20 – 12.40	**Applied Artificial Neural Networks and Genetic Algorithms in Simulation Strategy for Trajectory in Collaborative Robotic** Marcio Mendonca, Rodrigo Palacios,	**Forecasting Winter Precipitation based on Weather Sensors Data in Apache Spark** Andreas Kanavos, Theodor Panagiotakopoulos, Gerasimos Vonitsanos,	**"Coordinates' Line Subtitles": a Spicy Feature in VR360 Videos for Events' Locations** Nikolaos Tsatsakis, Nikolaos Papadakis, Panagiotis Bariamis

	Elpiniki Papageorgiou, Ivan Chrun, Lillyane Cintra, Konstantinos Papageorgiou	Manolis Maragoudakis, Yiannis Kiouvreki	
12.40 – 13.00	**Semantic Scene Segmentation for Robotics Applications** Maria Tzelepi, Anastasios Tefas	**A FIWARE-based IoT Framework for Smart Water Distribution Management** Theodor Panagiotakopoulos, Dimitrios Vlachos, Thanasis Bakalakos, Andreas Kanavos, Achilles Kameas	**Evaluation of Public Funding Processes by Mining Event Logs** Aimilia Zisimou, Ioanna Kalaitzoglou, Georgia Theodoropoulou, Alexandros Bousdekis, Georgios Miaoulis
13.00 – 13.20	**Comparison of Image segmentation, HOG and CNN Techniques for the Animal Detection using Thermography Images in Automobile Applications** Yuvaraj Munian, Antonio Martinez-Molina, Miltiadis Alamaniotis	**Smart Home Assistance for humans with episodic memory decline problems using a fuzzy rule-based mechanism: The case of stove usage** Konstantina Chrysafiadi, Evangelia-Aikaterini Tsichrintzi	**Modeling of Medical Devices Classification with Computational Argumentation** Sofia Almpani, Yiannis Kiouvrekis, Petros Stefaneas
13.20 – 13.40	**Sharpness Enhancement of Stereo Images Using a Depth-Based Per-Pixel Regularization** Juan Andrade	**The application of Blockchain technology in Copyright field: formalities and "smart contracts"** Evangelia Kokotsaki, Galateia Kapellakou, Spyros Sioutas, Dimitrios Tsolis, Anastasios Giannaros	-----------------------
13.45 – 14.00	*BREAK*		
14.00 – 15.00	**Keynote Speech-2** (ROOM-1) **Nancy Alonistioti** **5G and AI Revolutionizing Data Engineering and the Vertical Industries**		

Wednesday, 14 July 2021

	ROOM-1	ROOM-2	ROOM-3
09.00 – 10.00	**Keynote Speech-3 (ROOM-1)** **Peter Groumpos** **COVID-19 and the Big Data Driven World: Issues, Challenges and Opportunities**		
10.00 – 10.15	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
10.15 – 12.00	**WM-1** Applications and Services Session Chair: E. Sakkopoulos	**WM-2** Advances in Machine Learning - I Session Chair: S. Kotsiantis	**WM-3** AI/ML-based Applications - I Session Chair: G.A. Tsihrintzis
10.15 – 10.35	**In the Fog: Application Deployment for the Cloud Continuum** Dimitris Apostolou, Yiannis Verginadis, Gregoris Mentzas	**Quantum Information Processing Algorithms with Emphasis on Machine Learning** Glen Uehara, Andreas Spanias, William Clark	**Data Mining for Targeted Inspections Against Undeclared Work by Applying the CRISP-DM Methodology** Eleni Alogogianni, Maria Virvou
10.35 – 10.55	**Cloud Computing: Serverless** Arne Koschel, Irina Astrova, Marc Schaaf	**Hybrid Quantum Differential Evolution** Clara Pizzuti	**Nutritional Biomarkers and Machine Learning for Personalized Nutrition Applications and Health Optimization** Dimitrios P. Panagoulias, Dionisios N. Sotiropoulos, George A. Tsihrintzis
10.55 – 11.15	**A survey on Deep Neural Network accelerators: From local to virtualized FPGA in the Cloud** Chen Wu, Virginie Fresse, Hubert Konik, Benoit Suffran	**Dynamic k determination in k - NN classifier: A literature review** Merkourios Papanikolaou, Georgios Evangelidis, Stefanos Ougiaroglou	**Stock Trend Prediction by Fusing Prices and Indices with LSTM Neural Networks** Vasilis Karlis, Katerina Lepenioti, Alexandros Bousdekis, Gregoris Mentzas
11.15 – 11.35	**A Look at Service Meshes** Arne Koschel, Irina Astrova, Marc Schaaf	**Neural Network Solution of Partial Differential Equations in Non-Rectangular Domains via Unconstrained Training** Pola Lydia Lagari, Lefteri H. Tsoukalas	**Short Survey of Artificial Intelligent Technologies for Defect Detection in Manufacturing** Elpiniki Papageorgiou, Theodosis Theodosiou, George Margetis, Nikolaos Dimitriou, Paschalis Charalampous, Ioannis Samakovlis
11.35 –	**Transforming procedures to web**	**A comparative study of validity indices on**	**Discovering Influential Twitter Authors Via**

	ROOM-1	ROOM-2	ROOM-3
11.55	**applications using IFML: The new Greek Citizenship Test** Stavros Piotopoulos, Evangelos Sakkopoulos	**estimating the optimal number of clusters** Aikaterini Karanikola, Charalampos M. Liapis, Sotiris Kotsiantis	**Clustering And Ranking On Apache Storm** Christina Saravanou, Georgios Drakopoulos, Andreas Kanavos, Eleanna Kafeza, Christos Makris
12.00 - 12.30	*BREAK*		
	ROOM-1	ROOM-2	ROOM-3
12.30 – 14.15	**WA-1** Applications and Services - II Session Chair: E. Alepis	**WA-2** Advances in Machine Learning - II Session Chair: S. Ougiaroglou	**WA-3** AI/ML-based Applications - II Session Chair: G.A. Tsihrintzis
12.30 - 12.50	**Web of Things Functionality in IoT: A Service Oriented Perspective** Euripides Petrakis, Aimilios Tzavaras	**Bayesian Optimization in High-Dimensional Spaces: A Brief Survey** Mohit Malu, Gautam Dasarathy, Andreas Spanias	**Deep Learning with hyper-parameter tuning for COVID-19 Cough Detection** Sunil Rao, Vivek Narayanaswamy, Michael Esposito, Jayaraman Thiagarajan, Andreas Spanias
12.50 – 13.10	**COVID-19 MOBILE TRACKING APPLICATION UTILIZING SMART SENSORS** Efthimios Alepis, Maria Virvou, Polychronis Kontomaris	**Semantic Information in Gating Patterns of Dynamic Convolutional Neural Networks** Ilias Theodorakopoulos, George Economou	**A Study of Dimensionality Reduction's Influence on Heart Disease Prediction** Gaoshuai WANG, Fabrice Lauri, Amir Hajjam El Hassani
13.10 – 13.30	**A Factoid based Question Answering System based on Dependency Analysis and Wikidata** Thomas Ploumis, Isidoros Perikos, Foteini Grivokostopoulou, Ioannis Hatzilygeroudis	**A comparison of the optimized LSTM , XGBOOST and ARIMA in Time Series forecasting** Iliana Paliari, Aikaterini Karanikola, Sotiris Kotsiantis	**An improved CNN model based on fused time-frequency features for mental fatigue detection in BCIs** Chen Kun, Li Zhilei, Ai Qingsong, Liu Quan, Wang lei
13.30 – 13.50	**Five-Factor Musical Preference Prediction for Solving New User Cold-Start Problem in Content-Based**	**Bayesian optimization for the design of deep neural networks** Nikolas Giannakis, Nikolaos Gorgolis, Ioannis	**Transfer Learning in sEMG-based Gesture Recognition** Panagiotis Tsinganos, Jan Cornelis, Bruno Cornelis, Bart Jansen, Athanassios

	Music Recommender System Keisuke Okada, Tan Phan Xuan, Eiji Kamioka	Hatzilygeroudis	Skodras
13.50 – 14.10	**Hybrid NR Video Quality Metric with Decodable Payload** Chulhee Lee	**Prototype Selection and Generation with Minority Classes Preservation** Konstantinos Xouveroudis, Stefanos Ougiaroglou, Georgios Evangelidis, Dimitris Dervos	**Handling Uncertainty in Predictive Business Process Monitoring with Bayesian Networks** Ioannis Prasidis, Nikolaos-Paraskevas Theodoropoulos, Alexandros Bousdekis, Georgia Theodoropoulou, Georgios Miaoulis
14.15 – 14.30	**Closing Session** (ROOM-1) **Professor George A. Tsihrintzis**, University of Piraeus, Greece **Professor Maria Virvou**, University of Piraeus, Greece **Professor Ioannis Hatzilygeroudis**, University of Patras, Greece		

Tutorial on Quantum Computing Algorithms for Machine Learning and Signal Processing

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Abstract: This tutorial will present the basic concepts of quantum computing algorithms with the emphasis on Signal Processing and Machine Learning. The tutorial will start with the physics of quantum systems and cover basic concepts and properties including qubits, entanglement and qubit deciphering errors. We then begin focusing on quantum data and signal processing with details on the building blocks of computational operations, simulation, and implementation. The presenters will then discuss details of quantum computing and describe how to express quantum information processing algorithms. The discussion covers the methodologies used to transform classical machine learning algorithms to actual quantum expressions. The presentation on modeling algorithms will cover a hybrid classical-quantum approach and quantum simulators. In the last part of the tutorial, we present some of current industry and academic efforts, available quantum toolkits and navigation through an extensive bibliography which we will also cover in our survey paper submitted to IISA 2021.

Biographies of Instructors

Glen S. Uehara has worked in the communication field for over 25 years. He worked in various areas, including cellular technolgoies (CDMA, GSM, 3G), GPS navigation engines, (Iridium) satellite communications, and various voice and video compressions techniques. During his career, Glen has filed many patents and granted three. He has earned his BS and MSE in Electrical Engineering from the University of Hawaii and Arizona State University respectively. In recent years, Glen has also earned several cybersecurity certifications and have applied these techniques to many programs. He also uses this knowledge to help train individuals at his company and as capstones at the University. Glen is currently pursuing his PhD at Arizona State University. His current area of research is in the Applications of Quantum Algorithms, specifically in Signal Processing and Machine Learning. He is continuing his research in Quantum Algorithms both at his current employment and at Arizona State University. Glen is exploring potential industrial applications of Quantum Computing Algorithms.

Andreas Spanias is Professor in the School of Electrical, Computer, and Energy Engineering at Arizona State University (ASU). He is also the director of the Sensor Signal and Information Processing (SenSIP) center and the founder of the SenSIP industry consortium (also an NSF I/UCRC site). His research interests are in the areas of adaptive signal processing, speech processing, machine learning, quantum and sensor systems. He is author of two textbooks: Audio Processing and Coding by Wiley and DSP; An Interactive Approach (2nd Ed.). He contributed to more than 350 papers, 11 monographs, 11 full patents and10 provisional patents. He served as Associate Editor of the IEEE Transactions on Signal Processing and as General Co-chair of IEEE ICASSP-99. He also served as the IEEE Signal Processing Vice-President for Conferences. Andreas Spanias is co-recipient of the 2002 IEEE Donald G. Fink paper prize award and was elected Fellow of the IEEE in 2003. He served as Distinguished Lecturer for the IEEE Signal processing society in 2004. He is a series editor for the Morgan and Claypool lecture series on algorithms and software. He received the 2018 IEEE Phoenix Chapter award with citation: "For significant innovations and patents in signal processing for sensor systems." He also received the 2018 IEEE Region 6 Outstanding Educator Award (across 12 states) with citation: "For outstanding research and education contributions in signal processing." He was elected recently to Senior Member of the National Academy of Inventors.

Conference Venue

IISA 2021 was originally planned to be a live conference with Chania, Crete, Greece as its venue. However, the COVID-19 pandemic and related travel restrictions and lockdowns forced us to hold IISA 2021 as a virtual/online conference.

Conference Coordinators

Easy Conferences Ltd has been in business since 1992 and has been specializing in the complete coordination and organization of conferences and all related activities. Through the development of its own online registration software, in recent years the company has expanded its operations in various countries. We have extensive experience in organizing events ranging from 20 to 2000 participants.

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