The 14th International Conference on Information, Intelligence, Systems and Applications

10-12 July 2023, University of Thessaly, Volos, Greece

https://easyconferences.eu/iisa2023/

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.

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IISA 2023 Chairs' Message

Welcome to the Fourteenth International Conference on Information, Intelligence, Systems, and Applications (IISA 2023). **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 in which high-quality original research and developments is presented. The IISA conference features tutorials, technical paper presentations, workshops, and distinguished keynote speeches.

This year's conference marks the fourteenth IISA. IISA 2023 is organized by the University of Piraeus, Greece, the University of Thessaly, Greece and the Biological and Artificial Intelligence Foundation, USA. Technical sponsorship is also provided by the Institute of Electrical and Electronics Engineers (IEEE) and its Computer Society. IISA 2023 will be a live conference with Volos, Greece as its venue. IISA 2023 will last for three days and its technical program consists of twenty-three (23) technical paper presentation sessions, three (3) keynote speeches and one (1) hourly tutorial presntaion. We received 263 high quality submissions authored by authors-researchers from over 25 countries around the world. Out of them, ninety-nine (99) were accepted as full (eight-page) papers, which corresponds to an acceptance rate of 37,6%. An additional thirty-two (32) of the submissions were accepted as short (four-page) papers, which corresponds to 12,4% of the submissions. Moreover, accepted full and short papers authors represented academia, government, industry, and business.

We are thankful to the many people who contributed to the success of IISA 2023. Firstly, thanks are due to the paper authors, including those whose papers were not accepted in the program, for choosing IISA 2023 as the forum for dissemination of the results of their research. We are also thankful to the IISA 2023 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 2023. Thanks are also due to the University of Piraeus, the University of Thessaly, the Biological and Artificial Intelligence Foundation and IEEE for their technical co-sponsorship of the conference. For their actions to organize the conference, many thanks are due to the

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Associate Professor-Dr. Aspassia Dascalopulu, University of Thessaly, Greece
Associate Professor-Dr. Evangelos Sakkopoulos, University of Piraeus, Greece,

as well as to the **Publicity Chairs**:

Assistant Professor-Dr. Konstantina Chrysafiadi, University of Piraeus, Greece.

Last, but not least, special thanks are due to the **IISA 2022 coordinator, Easy Conferences Ltd., Cyprus**.

On behalf of the Fourteenth International Conference on Information, Intelligence, Systems, and Applications (IISA2023), we invite all of you to join us in Volos, Greece and enjoy the technical and the social program.

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

Invited Keynote Speakers

Petros Groumpos, University of Patras, Greece

<u>Title:</u> The Cybernetic Artificial Intelligence -(CAI): A New Mathematical Theory for Modelling Complex Dynamical Systems

<u>Abstract:</u>

Modeling is a fundamental task that serves as the starting point for analyzing and studying any physical or human-made system, including complex dynamical systems (CDS). The study of CDS has become a challenging new approach to science over the last few decades, investigating how relationships between system components give rise to collective behaviors, and how the system interacts and forms relationships with its environment. Over the past 70-80 years, artificial intelligence (AI) has dominated all scientific fields, promising to solve all of society's problems.

Deep Learning (DL), a subfield of AI, a type of machine learning that seeks to emulate the human brain while not necessarily matching its capabilities, has taken the industry by storm. However, a subset of DL called Cybernetics has largely gone unstudied by most researchers on AI. In his essay, Carlos E. Perez [1] argues that the foundations of DL can be traced back not only to McCulloch–Pitts's model of the artificial neuron but also to the work of Norbert Wiener, who wrote the book "Cybernetics: Control and Communication in the Animal and the Machine" [2]. The essay further asserts that DL researchers continue to "reinvent the wheel" but are losing sight of the wisdom found in Cybernetics [3].

Cybernetics is defined as the scientific study of communication and control. With the core concept of circular causality or feedback, it attempts to compare human and animal brains with that of machines and electronic devices. If that sounds familiar, it is because DL seeks to achieve a similar result. Perez [1] argues that the DL narrative, which became popular in 2012, has now become the dominant narrative. Some scientists believe that DL is trying to replace all of AI. Perez also states that this narrative hearkens back to the time when Wiener published Cybernetics in 1948, examining connectionist thinking [2]

It is a commonly overlooked fact that the adoption of the term "Artificial Intelligence" remains largely unexplored. Prior to the establishment of AI at Dartmouth College in 1956, three scientific names for the field of "thinking machines" existed, namely cybernetics, automata theory, and complex information processing. While cybernetics has been investigated and well known, the other two names were scientifically developed, analyzed, and defined long before AI. Binary logic is the foundation of both Cybernetics and AI, and both rely on the same principle for the results they produce. However, AI is culture-specific while the logical part is universal.

The 1956 Dartmouth Workshop was organized by Marvin Minsky, John McCarthy, Claude Shannon, and Nathan Rochester of IBM. At the conference, McCarthy persuaded attendees to accept "Artificial Intelligence" as the name of the field. The term was chosen to avoid associations with cybernetics and the influential cyberneticist Norbert Wiener. However, many scientists were aware of the important scientific contributions of cybernetics and intentionally chose the term AI. It is astonishing that Wiener was not invited to the 1956 Dartmouth conference. Cybernetics has often been overshadowed by AI in recent decades, but it has been returning to the public conscience and is being used in multiple fields. Cybernetics is an interdisciplinary science that focuses on how a system processes information, responds to it and changes, develops control actions, or restructures the whole system for better functioning. It is a general theory of information processing, feedback control, and decision making. Today, cybernetics is more relevant than ever before, as it studies mainly the concepts of control and communication in living organisms, machines, and organizations, including self-organization.

In this plenary talk, both scientific fields of AI and Cybernetics will be reviewed. Their basic characteristics will be identified. Recently scientists and mathematicians began to think in innovative ways to make machines smarter and more intelligent and approach human intelligent capabilities. AI and Cybernetics are the perfect examples of this human-machine merger. Binary logic is the main and same principle in both fields. Both terms are often used interchangeably. However, this brings confusion when both terms are studied. But they are slightly different; AI is based on the view that machines can act and behave like humans. Cybernetics is based on a cognitive view of the world. Further studies on this scientific aspect between AI and Cybernetics will clarify several scientific differences between them. A more appropriate term for modelling and controlling dynamical complex systems should be Cybernetic Artificial Intelligence (CAI). Such a new scientific field would successfully combine human intelligence (Cybernetics) with "machines" (AI) in a relatively meaningful and healthy merger.

1. Carlos E. Perez, The Deep Learning AI Playbook: Strategy for Disruptive Artificial Intelligence 1st Edition, October 2017.
2. Norbert Wiener, Cybernetics: Control and Communication in the Animal and the Machine. Oxford University Press, 1948.

3. Peter P. Groumpos, "Making the World a Better Place to Live through Wisdom and Philosophy" Elsevier Journal, IFAC-PapersOnLine Vol. 51, Issue 30, pp. 744-749, 2018.

Bio:

Prof. Peter P. Groumpos is an emeritus professor since 2017 at the department of Electrical and Computer Engineering of the University of Patras. He was born in Greece in 1950 at the small town of Xylocastron, Corinthia, Greece. At the age of 18 years old, he went to USA with the primary goal to do his University studies. He did his undergraduate and graduate studies at the Department of Electrical and Computer Engineering at the SUNY, Albany. He received his Ph.D. in 1978. He joined as an Assistant Professor, Cleveland State University, Ohio in 1980 and he was promoted to Associate professor in 1985. He was Vice President of the Advanced Manufacturing Center of Cleveland, Ohio (1983-1988). In 1990, he returned to his motherland Greece, after been elected as a full Professor at the Department of Electrical and Computer Engineering of the University of Patras.

In 1992, he established the Laboratory for Automation and Robotics to which has been its director till he retired in 2017. A Fulbright Scholar one year award by the State Department of USA. Chairman of the Dept. of Electrical and Computer Engineering, University of Patras (1999-2003). Academic Honorary Member of the Russian Academic Council of Mechatronics and Robotics 2002-2011 and Honorary Invited Professor of the University of Science and Technology of the Eastern China of Shanghai 2013-2017. President & CEO, Patras Science Park, Patras, Greece (2004–2010). Vice-President of the Technical Advisory Board, National Institute for Research, Greece, 2005-2010.The Greek National representative to a few high positions at European Management Committees (ESPRIT, ICT, IMS, INCO). Included in **a)** Who's Who in Frontiers of Science and Technology and b) Men of Achievement. General Chairman of IFAC Conferences, LSS '98 and MIM 2000, and of the IEEE Conferences, ISIC 2000 and MED 1994, 2000 and 2016.Chairman of the TC 9.5 of Large-Scale Systems of IFAC (1996-2001).

He has been teaching undergraduate and graduate courses in the thematic areas of automatic control, stochastic processes, intelligent control, Fuzzy systems, Robotics, modeling Complex Dynamic Systems and Bioinformatics. His research interests cover the broad thematic areas of modeling and control of large Complex Dynamic Systems, Intelligent control, Artificial Intelligence (AI), fuzzy systems, Fuzzy Cognitive Maps, Hybrid Energy Systems (HES), Intelligent Manufacturing systems, Renewable, Decision Support Systems (DSS), Knowledge Management, Creative software Computing, Simulation Methods, Technology Transfer and Innovation Systems.

He has conducted funded research using advanced new intelligent and fuzzy techniques in many applications and especially in Manufacturing, Health, Energy, Environment,

Agriculture and Transportation. He has been the principal investigator and/or participated as a partner in many R&D projects been funded by the EC, the Greek Government and/or the private sector. He has published four (4) books, edited seven (7) books, 14 invited chapters in books, over 320 papers in journals and/or in international conferences, and over 50 Technical Reports. He has more than 7000 citations and an h-index of 39. For two consecutive years, 2020 and 2021, he has been ranked internationally among the world's top scientists in Artificial Intelligence, ranking him in the top 2% of the most influential scientists, according to the published PLOS Biology 2020 & Mendeley Data 2020 lists and the Stanford University study "Updated science-wide author databases of standardized citation indicators".

Prof. Groumpos has been the Reviewer for several International Journals and for many International Conferences. Has organized more than 20 invited special sessions on Conferences and has been Keynote Plenary Invited Speaker in more than 30 International conferences.

Ioannis Stamelos, Aristotle University of Thessaloniki, Greece

Ioannis Stamelos, Aristotle University of Thessaloniki, Greece

Title: **Open-Source Software Policies and New Research Directives: Recent Advances**

Abstract:

The first part of the speech will present some basic concepts on open-source software (OSS) and recent developments on open-source policies worldwide. There is increasing interest in OSS both from the public and private sector point of view, while related policies are continuously updated and enhanced in favor of OSS. A major driver that has emerged in recent years is the need for OSPOs, Open Source Program Offices. OSPOs are dedicated units within large organizations (public institutions, large enterprises) that offer consultancy on OSS adoption practices and community building, along with high level technical support.

The second part will be dedicated to research directions, to meet the requirements of the new OSS policies and advance the state of the art in OSS engineering. Among other, OSS ecosystem analysis, OSS best practices, and OSS education are research areas of paramount importance.

Bio:

Ioannis Stamelos is a Professor at the School of Informatics of the Aristotle University of Thessaloniki, Greece, where he carries out research and teaching in the area of Software Engineering and Information Systems. He holds a diploma of Electrical Engineering (1983) and a PhD in Computer Science by the Aristotle University of Thessaloniki (1988). He has published approx. 250 articles in refereed international journals, conferences, etc. He is/was the scientific coordinator or principal investigator for his University in over 30 research and development projects in Information & Communication Technologies with funding from national and international organizations. Part of his research is in the field of open source software engineering.

He is currently the Head of the School of Informatics, he is directing the Center for Open Technologies at the Aristotle University and is also President of the Board of Directors of the Hellenic Alliance for Open Technologies (GFOSS).

Eleni Stroulia, University of Alberta, Canada

Dr. Eleni Stroulia, University of Alberta, Canada

Title: **Games for Cognitive Health and Improved Mobility**
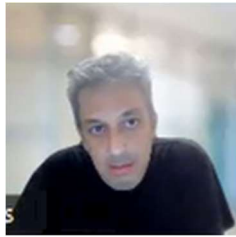
Abstract:

Mobility and cognition decline with illness and age. My team has been pursuing two parallel projects to investigate how games can offer an engaging method for older adults to exercise their cognitive and physical abilities. Specifically, the first project, called "VibrantMinds", offers a number of well-known entertaining games that challenge the user's perception, attention, language, and memory. The second project, called "VirtualGym", is a 2D and an immersive VR exergames platform, offering exercise routines adjustable to the user's mobility and, at the same time, challenging. In this presentation, we discuss the two systems, the key premises underlying their design, and some initial findings from our studies.

Bio:

Dr. Eleni Stroulia is a Professor in the Department of Computing Science, at the University of Alberta. From 2011-2016, she held the NSERC/AITF Industrial Research Chair on Service Systems Management, with IBM. Her research focuses on addressing industry-driven problems and interdisciplinary challenges, using AI and machine-learning methods. She has played leadership roles in the GRAND and AGE-WELL Networks of Centres of Excellence. In 2018 she received a McCalla professorship, and in 2019 she was recognized with a Killam Award for Excellence in Mentoring. From 2020 to 2023, she was the Director of the University of Alberta's AI4Society Signature Area, and since 2021 she is serving as the Vice Dean of the Faculty of Science.

Tutorial

Leonidas Akritidis, International Hellenic University, Greece

Title: **Learning from Imbalanced Data**

Abstract:

The problem of data imbalance is related to the uneven distribution of the training examples to the involved classes. In such cases, the vast majority of the input samples are associated with just one class (the majority class), whereas the rest of the classes are significantly underrepresented (minority classes). Nowadays, a broad variety of application areas suffer from class imbalance, including Cybersecurity, Bioinformatics, Natural Language Processing, Image and Multimedia data processing, and so on.

Using such data to train machine learning models is almost always problematic, since the produced models are strongly biased towards the majority class and cannot learn the minority classes sufficiently. As a consequence, the accuracy and the generalization capabilities of these models are significantly degraded.

In this tutorial the most modern advances in the field of classification with imbalanced data will be presented. The underlying techniques will be categorized according to the approach that they apply to confront the problem. The entire family of resampling techniques (over-sampling, under-sampling, hybrid-sampling, etc.) will be reviewed in details. In the sequel, algorithm-based approaches and cost-sensitive learning methods will be analyzed. The second part will summarize the current conclusions and it will include an inspiring description of the most important challenges in the area which that are still left open. Finally, some insights for the ongoing and future research will be discussed.

Bio:

Leonidas Akritidis is a post-doctoral research fellow in the Department of Science and Technology of the International Hellenic University. He is also a contracted lecturer in the same department since 2020. He holds a diploma in Electrical and Computer Engineering (2003) and a PhD in Electrical and Computer Engineering (2013). His research activity is focused on the fields of deep learning from text data, Natural Language Processing, Data Mining and Knowledge Discovery, data engineering, optimal rank aggregation, and parallel/distributed algorithms. He has published multiple research articles in leading international journals and scientific conferences. Moreover, he has designed and developed a broad collection of scientific and commercial applications and systems. He has contributed to the successful preparation and completion of various research projects with national and international funding.

Program at a Glance

TIME	MONDAY, JULY 10, 2023	TUESDAY, JULY 11, 2023	WEDNESDAY, JULY 12, 2023
08:00 - 08:30	REGISTRATION	———	———
08:30 - 09:00	OPENING SESSION	———	———
09:00 - 10:00	**KEYNOTE – 1** / ROOM 1	**KEYNOTE – 2** / ROOM 1	**KEYNOTE – 3** / ROOM 1
10:00 - 10:15	*COFFEE BREAK*	*COFFEE BREAK*	*COFFEE BREAK*
10:15 - 12:15	**MM-1** / ROOM 1 **MM-2** / ROOM 2 **MM-3** / ROOM 3 **MM-4** / ROOM 4	**TM-1** / ROOM 1 **TM-2** / ROOM 2 **TM-3** / ROOM 3 **TM-4** / ROOM 4	**WM-1** / ROOM 1 **WM-2** / ROOM 2 **WM-3** / ROOM 3 **WM-4** / ROOM 4
12:30 - 14:30	*LUNCH* *VEGGERA RESTAURANT* *41 SARANTAPOROU ST, VOLOS*	*LUNCH* *VEGGERA RESTAURANT* *41 SARANTAPOROU ST, VOLOS*	*LUNCH* *VEGGERA RESTAURANT* *41 SARANTAPOROU ST, VOLOS*
14:45 - 16:45	**MA-1** / ROOM 1 **MA-2** / ROOM 2 **MA-3** / ROOM 3 **MA-4** / ROOM 4	**TA-1** / ROOM 1 **TA-2** / ROOM 2 **TA-3** / ROOM 3 **TA-4** / ROOM 4	**WA-1** / ROOM 1 **WA-2** / ROOM 2 **WA-3** / ROOM 3 **WA-4 (TUTORIAL)** / ROOM 4
16:45 - 17:00	*COFFEE BREAK*	———	**CLOSING**
17:00 - 18:00	**DISCUSSION PANEL ON AI DEVELOPMENTS**	———	———
18:00 - 19:00	**WELCOME RECEPTION**	———	———
21.00 - 23.00	———	**BANQUET DINNER** *DOMOTEL XENIA VOLOS* *1 PLASTIRA ST, VOLOS*	———

Detailed Program

Monday, 10 July 2023

08.30 – 09.00	**Opening Session (ROOM-1)** **Professor Maria Virvou**, University of Piraeus, Greece **Professor Dimitrios Bargiotas**, University of Thessaly, Greece **Professor Elpiniki Papageorgiou**, University of Thessaly, Greece **Professor George A. Tsihrintzis**, University of Piraeus, Greece **Professor Vasilis Gerogiannis**, University of Thessaly, Greece **Professor Miltiadis "Miltos" Alamaniotis**, University of Texas-San Antonio, USA
09.00 – 10.00	**Keynote Speech-1 (ROOM-1)** **Professor Peter Groumpos** **The Cybernetic Artificial Intelligence -(CAI): A New Mathematical Theory for Modelling Complex Dynamical Systems** **Chair: George A. Tsihrintzis**

Session MM.1	**Advances in Machine Learning and Applications – 1**
Session Chairs: **George A. Tsihrintzis** **and** **Dionisios N. Sotiropoulos**	❖ *10:15-10:35* **Simulation and Comparison of Reinforcement Learning Algorithms** Dionisios Sotiropoulos and Konstantinos Spyropoulos ❖ *10:35-10:55* **A Machine Learning Approach for Effective Software Defect Detection** Maria Vasileiou, George Papageorgiou and Christos Tjortjis ❖ *10:55-11:15* **A Comparative Study of Recurrent and Dense Neural Networks for Classifying Maritime Terms** Despoina Mouratidis, Katia Lida Kermanidis, and Andreas Kanavos ❖ *11:15-11:35* **Predicting Fish Mortality: Artificial Neural Networks vs Symbolic Regression** Theofanis Aravanis, Aristidis Ilias, Ioannis Hatzilygeroudis, and Georgios Spiliopoulos ❖ *11:35-11:55* **Deep Learning-Based Seeded Image Segmentation with Label Propagation and Contour Orientation** Aldimir José Bruzadin, Marilaine Colnago, Rogério Galante Negri, and Wallace Casaca ❖ *11:55-12:15* **Improving Open Weather Prediction Data Accuracy Using Machine Learning Techniques** Evangelos Tsipis, Konstantina Banti, Malamati Louta, and Nikos Dimokas
Session MM.2	**Decision Support and Recommender Systems**
Session Chairs: **Michael Vassilakopoulos** **and** **Gregory Koronakos**	*10:15-10:35* **Academic Recommender Systems, Status, Challenges and Opportunities** Vaios Stergiopoulos, Eleni Tousidou, Michael Vassilakopoulos, and Antonio Corral *10:35-10:55* **OptiShip: A platform to support decisions during ship's life cycle** Gregory Koronakos, Yiannis Smirlis, Apostolos Karalis, Ernestos Tzannatos, and Kyriakos Poutos ❖ *10:55-11:15* **DECIDO Portal for evidence-based Policy-Making** Konstantinos Alexakis, Jabier Martinez, Panagiotis Kokkinakos, Antonio Filograna, Yury Glikman, Xabier Uriarte, and Dimitris Askounis ❖ *11:15-11:35* **Decision Making in Precision Agriculture – The case of VELOS Intelligent Decision Support System** Dimitrios Theodorou, Nikolaos Mantas, Ioanna Karampelia, Nikos Dimokas, Thomas Kyriakidis, and Malamati Louta

	❖ *11:35-11:55* **A Graph-based Approach for Representing Water Treatment Process Knowledge** *Nikos Papageorgiou, Dimitris Apostolou, Gregoris Mentzas, and Dimitra Pournara* ❖ *11:55-12:15* **Crop Recommendation in Smart Agriculture using IoT and Machine Learning** *Gregory Davrazos, Theodor Panagiotakopoulos, Sotiris Kotsiantis, and Achilles Kameas*
Session MM.3 Session Chairs: **Maria Virvou** **and** **Efthimios Alepis**	**Educational Informatics - 1** *10:15-10:35* **Centrality Metrics from Students' Discussion Fora at Distance Education** *Evgenia Paxinou, Evangelia Manousou, Vassilios Verykios, and Dimitrios Kalles* ❖ *10:35-10:55* **An Empirical Study on the Use of Emojis for Students' Emotions in e-Learning of Mathematics** *Dimitrios Zarkadoulas and Maria Virvou* ❖ *10:55-11:15* **Faculty Members' Perceptions of Remote Electronic Examinations in Distance Academic Education** *Leonidas Theodorakopoulos, George Vorvilas, Alexandros Liapis, Nikos Karousos, Eirini Lagiou, and Achilles Kameas* ❖ *11:15-11:35* **Digital and Socio-emotional Benefits of the Students and the Teachers from the Implementation of a STEAM Education Project** *Gerasimos Kalogeratos, Angeliki Alexandropoulou, and Christos Pierrakeas* ❖ *11:35-11:55* **A Combination of Genetic Algorithms and Local Search to Solve a Real Data University Timetable Scheduling Problem** *Evgenia Psarra and Dimitris Apostolou* ❖ *11:55-12:15* **A Clustering-based Approach for Ranking Universities** *George Matlis, Nikos Dimokas, and Petros Karvelis*
Session MM.4 Session Chairs: **Alex Thomo** **and** **Dimitrios Panagoulias**	**ICT in Medicine and Healthcare - 1** *10:15-10:35* **Applying D.O.I. Theory to Assess the Required Level of Explainability in Artificial Intelligence-empowered Medical Applications** *Dimitrios Panagoulias, Maria Virvou and George A. Tsihrintzis* *10:35-10:55* **Identifying Autism Spectrum Disorder Using Brain Networks: Challenges and Insights** *Keanelek Enns, Alex Thomo, and Venkatesh Srinivasan* ❖ *10:55-11:15* **Covid-19 New Cases Correlation Analysis: Weather Conditions, Citizen Traffic and Vaccination Statistics impact in NARX Estimated Regressions in Attica, Greece** *Anargyros Douladiris and Efthimios Alepis*

	❖ *11:15-11:35* **Sentiment Analysis on English and Greek Twitter Data regarding Vaccinations** *Chrysoula Dontaki, Paraskevas Koukaras, and Christos Tjortjis* ❖ *11:35-11:55* **A Review of Fraudulent Practices in Healthcare Insurance and Machine Learning-Based Investigation Approaches** *Aishat Salau, Nnanna Nwojo Agwu, and Moussa Mahamat Boukar* ❖ *11:55-12:15* **YouTube Sentiment Analysis on Healthcare Product Campaigns: Combining Lexicons and Machine Learning Models** *Panagiota Anastasiou, Katerina Tzafilkou, Dimitrios Karapiperis, and Christos Tjortjis*
Session MA.1 Session Chairs: **Miltos Alamaniotis** **and** **George A. Tsihrintzis**	**Advances in Machine Learning and Applications – 2** ❖ *14:45-15:* **Interpretable Machine Learning for Undeclared Work Prediction** *Eleni Alogogianni and Maria Virvou* ❖ *15:05-15:25* **On Beat Tracking and Tempo Estimation of Musical Audio Signals via Deep Learning** *Dimitris Tsipianitis, Alexandros Iliadis, Athanasios Paraskevas, Konstantinos Tsaprailis-Chablas, and Panagiotis Trakas* ❖ *15:25-15:45* **Automated Binary Program Partitioning through Structural Analysis** *Michail Alexiou and Sukarno Mertoguno* ❖ *15:45-16:05* **Currency Exchange Rate Forecasting Using Support Vector Classifiers** *Themistoklis Koutsellis, Ioanna Makarouni, Stylianos Choumas, Christopher Ververidis, Thomas Papapolyzos, Anastasios Bitsikas, and Haris Doukas* ❖ *16:05-16:25* **Comparative Analysis of Thermogram and Pre-processed HoG Images using Machine Learning Classifiers** *Yuvaraj Munian, Antonio Martinez Molina and Miltos* ❖ *16:25-16:45* **Modelling Data-Driven Digital Twins of EV Batteries for Predictive Analytics** *Afroditi Fouka, Katerina Lepenioti, Alexandros Bousdekis, and Gregoris Mentzas*
Session MA.2 Session Chair: **Dionisios N. Sotiropoulos**	**Social Media Analytics and Applications** ❖ *14:45-15:* **Social Network Data Enabling Smart Tourism** *Aristea Kontogianni and Efthimios Alepis* ❖ *15:05-15:25* **Sentiment Analysis with the Use of Transformers and BERT** *Elisavet Douka, Isidoros Perikos, and Ioannis Hatzilygeroudis* ❖ *15:25-15:45* **Popularity Inference based on Semantic Sentiment Analysis of YouTube Video Comments** *Athanasios Gkillas, Michael Angelos Simos and Christos Makris*

	❖ *15:45-16:05* **A Study on Rewarding Mechanisms for Activating Silent Users in Social Media** *Maria Anastasia Katikaridi, Aphrodite Tsalgatidou and Eleni Koutrouli* ❖ *16:05-16:25* **Forecasting Stock Market Alternations using Social Media Sentiment Analysis and Deep Neural Networks** *Christina Saravanos and Andreas Kanavos* ❖ *16:25-16:45* **Understanding Bias in Twitter-based Intelligence Analysis** *Alexandros Karakikes, Panagiotis Alexiadis, Theocharis Theocharopoulos, Nikolaos Skoulidas, and Konstantinos Kotis*
Session MA.3 Session Chairs: **Bill Kapralos** **and** **Efthimios Alepis**	**Educational Informatics - 2** ❖ *14:45-15:* **Serious Game Design and Development: Some Recommendations** *Robert Savaglio, Jacqueline Brown, Bill Kapralos, Beatriz Franco Arellano, Ann LeSage, and JoAnne Arcand* ❖ *15:05-15:25* **LbTyping: A Web Application for Programming Learning by Typing** *Takehiko Murakawa* ❖ *15:25-15:45* **The Use of ICT in Education Administration concerning Principals of Greek Primary Schools** *Paraskevi Galani and Christos Pierrakeas* ❖ *15:45-16:05* **The Use of Internet Technology to mitigate Conflict between Mapuche and non-Mapuche Students in a University Context** *Marcos Levano and Billy Peralta* ❖ *16:05-16:* **Adaptive Quizzes using Fuzzy Genetic Algorithm** *Spyros Papadimitriou, Konstantina Chrysafiadi and Maria Virvou* ❖ *16:25-16:45* **Incorporating Data Warehouses into Data Pipelines for Deploying Learning Analytics Dashboards** *Rozita Tsoni, Georgia Garani and Vassilios Verykios*
Session MA.4 Session Chairs: **Elpiniki Papageorgiou** **and** **Dimitris Tsipianitis**	**Advanced Analytics in Biomedicine** ❖ *14:45-15:* **Explainable Classification for Non-Small Cell Lung Cancer based on Positron Emission Tomography Features and Clinical Data** *Agorastos-Dimitrios Samaras, Ioannis Apostolopoulos, Elpiniki Papageorgiou, Serafeim Moustakidis, Nikolaos Papathanasiou, Dimitris Apostolopoulos, and Nikolaos Papandrianos* ❖ *15:05-15:25* **Deep Fuzzy Cognitive Map Methodology for Non-Small Cell Lung Cancer Diagnosis based on Positron Emission Tomography Imaging** *Anna Feleki, Ioannis Apostolopoulos, Elpiniki Papageorgiou, Serafeim Moustakidis, Nikolaos Papathanasiou, Dimitris Apostolopoulos, Konstantinos Kokkinos, and Nikolaos Papandrianos*

	❖ *15:25-15:45* **Investigation of Novel Muon Imaging System in Cardiovascular Operations: A Simulation Approach** *Elham Gharibshahi, Dimitrios MIserlis, and Miltos Alamaniotis* ❖ *15:45-16:05* **Development of a Low Cost Elecromyogram (EMG) Circuit for EMG Tracking** *Dimitris Tsipianitis, Panagiotis Flogeras and George Souliotis* ❖ *16:05-16:* **Abnormal Parathyroid Gland localization in Scintigraphic Images using a Vision Transformer Network** *Ioannis Apostolopoulos, Nikolaos Papathanasiou, Nikolaos Papandrianos, Elpiniki Papageorgiou, and Dimitrios Apostolopoulos* ❖ *16:25-16:45* **Operation Study and Recognition of the Heart Function via Heartbeats using LabVIEW** *Dimitris Tsipianitis, Dimitra Drakopoulou and Georgios Mandellos*

Tuesday, 11 July 2023

09.00 – 10.00	**Keynote Speech-2 (ROOM-1)** **Professor Ioannis Stamelos** **Open-Source Software Policies and New Research Directives: Recent Advances** **Chair: Maria Virvou**

Session TM.1	**Rapidly Growing Artificial Intelligence Development and Applications**
Session Chairs: **Maria Virvou** **and** **George A. Tsihrintzis**	❖ *10:15-10:35* **A Novel Trust State-Chart Model for Requirements Engineering of Trustful AI-Empowered Software** *Maria Virvou and George A. Tsihrintzis* ❖ *10:35-10:55* **Pre-made Empowering Artificial Intelligence: The Growing Importance of Human AI-Experts** *Maria Virvou and George A. Tsihrintzis* ❖ *10:55-11:15* **Guided Learning Based on Bezier Curves with Selective Weight Adjustment** *Chulhee Lee* ❖ *11:15-11:35* **Efficient Resume Classification through Rapid Dataset Creation Using ChatGPT** *Panagiotis Skondras, George Psaroudakis, Panagiotis Zervas, and Giannis Tzimas* ❖ *11:35-11:55* **Development of an Intelligent Chatbot for an Intraosseous Access Serious Games** *Fabiola Stancati, Agazio Riitano, Bill Kapralos, Dale Button, Adam Dubrowski, and Fabrizio Lamberti* ❖ *11:55-12:15* **Matching Products with Deep NLP Models** *Leonidas Akritidis and Panayiotis Bozanis*
Session TM.2	**Intelligence-infused Systems**
Session Chairs: **Dimitrios Panagoulias** **and** **Efthimios Alepis**	❖ *10:15-10:35* **Evaluating the potential of LLMs and ChatGPT on Medical Diagnosis and Treatment** *Dimitrios Panagoulias, Filippos Palamidas, Maria Virvou, and George A. Tsihrintzis* ❖ *10:35-10:55* **Design of Real-Time Multiplayer Word Game For The Android Platform Using Firebase And Fuzzy Logic.** *Michail Tselepatiotis and Efthimios Alepis* ❖ *10:55-11:15* **Synergism of Fuzzy Numbers and Data Smoothing for Abrupt Change Detection in Gamma-Ray Measurements-Making** *Michael Squire and Miltos Alamaniotis* ❖ *11:15-11:35* **Fuzzy Logic for Personalisation of Fire Emergency Alerts via Mobile Phones** *Nancy Alonistioti, Evangelia-Aikaterini Tsichrintzi, Konstantina Chrysafiadi, and Efthimios Alepis* ❖ *11:35-11:55* **Optimization of University Operations By Means of Fuzzy Cognitive Maps** *Panagiotis Perivolaris and Vassilios Stylianakis*

	❖ *11:55-12:15* **Encouraging AI Adoption by SMEs: Opportunities and Contributions by the ICT49 Project Cluster** *Ourania Markaki, Aikaterini Papapostolou, Spiros Mouzakitis, Izabela Zrazinska, Urszula Sobek, Thomas Wilczek, Antonis Troumpoukis, Xenia Ziouvelou, Vangelis Karkaletsis, Alexandra Carrasco Szulc, Miriam Garcia, Gabriele Röger, Andrea Micheli, Jaime Alessandro Codagnone, and Miguel de Prado*
Session TM.3 Session Chairs: **Haris Doukas**, **Vangelis Marinakis,** **Gema Hernández Moral** and **Zoi Mylona**	**Big Data Analytics in the Energy - 1** ❖ *10:15-10:35* **A Web-based Service supporting Local Governments in SECAP Implementation Activities** *Nikolaos Dimitropoulos, Eliza Milioni, Marcelo Lampkowski, Elissaios Sarmas, Panagiotis Kapsalis, Vangelis Marinakis, and Haris Doukas* ❖ *10:35-10:55* **A Unified Framework for Querying Dynamic and Semantic Data Sources** *Konstantinos Touloumis, Panagiotis Kapsalis, Elissaios Sarmas, Stathis Stamatopoulos, Evangelos Karakolis, and Vaggelis Marinakis* ❖ *10:55-11:15* **A Next Generation Library of AI-based Data-driven Services for the Built Environment** *Elissaios Sarmas, Stathis Stamatopoulos, Panagiotis Kapsalis, Konstantinos Touloumis, and Vangelis Marinakis* ❖ *11:15-11:35* **Application of Big Data Analytics in the Electrical Sector: a Real Case Study** *Marco Antonio Bucarelli, Francesca Santori, Andrea Natalini, Marzia Mammina, Salvatore Cipolla, Vangelis Marinakis, and Elissaios Sarmas* ❖ *11:35-11:55* **Building a Data Lake for Smart Building Data: Architecture for data interoperability** *José L. Hernández, Susana Martín, Panagiotis Kapsalis, Kyriakos Katsigarakis, Elissaios Sarmas, and Vangelis Marinakis* ❖ *11:55-12:15* **An integrated AI-based Information System for Energy Forecasting** *Panagiotis Skaloumpakas, Zoi Mylona, Sofoklis Strompolas, Elissaios Sarmas, and Haris Doukas*

Session TM.4	ICT in Medicine and Healthcare - 2
Session Chairs: **Alex Thomo** **and** **Dimitrios Panagoulias**	❖ *10:15-10:35* **A Machine Learning pipeline using KNIME to predict hospital admission in the MIMIC-IV Database** *Rozita Tsoni, Vasileios Kaldis, Ioanna Kapogianni, Aikaterini Sakagianni, Georgios Feretzakis, and Vassilios Verykios* ❖ *10:35-10:55* **Determining Factors contributing to Psychological and Sleep Quality Impacts of COVID-19 amongst University Students using Hypergeometric Test and Permutation-based Inference** *Geoffrey Solano, Editho III Giray, Michael Tee, Cherica Tee, Josefina Ly-Uson, Ryszard Sitarz, and Hanna Karakuła-Juchnowicz* ❖ *10:55-11:15* **Implementation of a System for the real-time recording of patient medical data both within and outside the Hemodialysis Unit** *Dimitrios Tsakiridis, Anastasios Vasiliadis, and Yiannis Tsakiridis* ❖ *11:15-11:35* **Uncovering the semantics of PD patients' movement data collected via off-the-shelf wearables** *Pavlos Bitilis, Nikolaos Zafeiropoulos, Adam Koletis, and Konstantinos Kotis* ❖ *11:35-11:55* **An Overview of Making Decisions on Medical Problems using Fuzzy Cognitive Maps** *George A. Krimpas, Nikolaos A. Krimpas, and Peter P. Groumpos* ❖ *11:55-12:15* **Automated Pneumonia Detection from Chest X-ray Images using Deep Convolutional Neural Networks** *Orestis Papadimitriou, Athanasios Kanavos, and Manolis Maragoudakis*
Session TA.1	Advances in Machine Learning and Applications – 3
Session Chairs: **Miltos Alamaniotis** **and** **George A. Tsihrintzis**	❖ *14:45-15:05* **A Comparative Study of Machine Learning Algorithms and Text Vectorization Methods for Fake News Detection** *Andreas Kanavos, Ioannis Karamitsos, Alaa Mohasseb, and Vassilis Gerogiannis* ❖ *15:05-15:25* **Comparison of Machine Learning Algorithms for predicting CO2 Emissions in the Maritime Domain** *Vasileios Michalakopoulos, Loukas Ilias, Panagiotis Kapsalis, Spiros Mouzakitis, and Dimitris Askounis* ❖ *15:25-15:45* **IoT Device Identification using a Meta-ensemble Multi-class Classifier** *Gregory Davrazos, Theodor Panagiotakopoulos, Sotiris Kotsiantis, and Achilles Kameas* ❖ *15:45-16:05* **Enhancing Sign Language Recognition using Deep Convolutional Neural Networks** *Athanasios Kanavos, Orestis Papadimitriou, Phivos Mylonas, and Manolis Maragoudakis* ❖ *16:05-16:25* **Bulk sample analysis using associated alpha particle neutron generator and artificial neural network** *Hadi Shahabinejad and Miltos Alamaniotis*

	❖ *16:25-16:45* **Greek political speech classification using BERT** *Dionisios Sotiropoulos and Kontilenia Maria Kotsifakou*
Session TA.2 Session Chair: **Konstantinos Chatzilygeroudis** **and** **Dionisios N. Sotiropoulos**	**Intelligent Robots and UAV Swarms** ❖ *14:45-15:* **Evolving Dynamic Locomotion Policies in Minutes** *Konstantinos Chatzilygeroudis, Constantinos Tsakonas, and Michael Vrahatis* ❖ *15:05-15:25* **Effective Skill Learning via Autonomous Goal Representation Learning** *Constantinos Tsakonas and Konstantinos Chatzilygeroudis* ❖ *15:25-15:45* **Step by Step Building and Evaluation of Low-Cost Capacitive Technology Touch System for Human- Social Robot Interaction** *Konstantinos Tsirkas, Anna-Maria Velentza and Nikolaos Fachantidis* ❖ *15:45-16:05* **UAV Swarms & Task Allocation: the Way ahead in Precision Agriculture** *Ioanna Karampelia, Thomas Kyriakidis and Malamati Louta*
Session TA.3 Session Chairs: **Haris Doukas**, **Vangelis Marinakis,** **Gema Hernández Moral** **and** **Zoi Mylona**	**Big Data Analytics in the Energy - 2** ❖ *14:45-15:* **Building Stock Datasets Analysis in the BuiltHub Project** *Carla Rodríguez Alonso, Victor Iván Serna González and Gema Hernández Moral* ❖ *15:05-15:25* **Distributed Ledger Technology in Energy Services: The InEExS Project Objectives and Approach** *Aikaterini Papapostolou, Ioanna Andreoulaki, Sokratis Divolis, Filippos Anagnostopoulos, and Vangelis Marinakis* ❖ *15:25-15:45* **An Energy Efficiency Marketplace for Buildings: The ENERGATE System Architecture** *Panagiotis Kapsalis, Aikaterini Papapostolou, Konstantinos Touloumis, Zoi Mylona, Ioanna Andreoulaki, and Haris Doukas* ❖ *15:45-16:05* **Matching Mechanisms for Buildings Energy Flexibility Orders in P2P Local Markets** *Dan Mitrea, Liana Toderean, Tudor Cioara, Viorica Chifu, Ioan Salomie, Ionut Anghel, Massimo Bertoncini, and Vincenzo Croce* ❖ *16:05-16:* **Energy Sector Digitilisation: A Security Framework application for Role-Based Access Management** *Georgios Kormpakis, Panagiotis Kapsalis, Konstantinos Alexakis, Zoi Mylona, Sotiris Pelekis, and Vangelis Marinakis* ❖ *16:25-16:45* **Data Spaces as enablers of a trusted Energy Data Ecosystem** *Sonia Jimenez and Silvia Castellvi*

Session TA.4	**Intelligence in Digital Humanities**
Session Chair: **Dimitrios Tsolis**	❖ *14:45-15:* **Community Structure and Coherence in Digital Humanities Works** *Shera Potka and Alex Thomo* ❖ *15:05-15:25* **Computational Creativity Under the Framework of Recoloring Art Paintings for Color-Blindness** *Eftichia Angeli, Christos Cholevas, Emmanouil Mavrikos, Stamatis Chatzistamatis, and George Tsekouras* ❖ *15:25-15:45* **Virtual Street Museum – An Augmented Reality Application for the Emergence of the Ancient Topography for the center of Athens** *Dimitrios Tsoukalos, Dimitrios Tsolis, and Anastasios Giannaros* ❖ *15:45-16:05* **Novel Museum Digitalization Framework: The Use Case of Athens Museum of Paleontology and Geology** *Georgia Stavropoulou, Konstantinos Tsitseklis, Athina Thanou, Eleni Fotopoulou, Anastasios Zafeiropoulos, Konstantinos Kotsopoulos, Nikos Papastamatiou, Vicky Orfanidou, and Symeon Papavassiliou* ❖ *16:05-16:25* **Citing the impact of pandemic Covid-19 on cultural sector** *Danai Katsanta and Dimitrios Tsolis*

Wednesday, 12 July 2023

09.00 – 10.00	**Keynote Speech-3 (ROOM-1)** **Professor Eleni Stroulia** **Games for Cognitive Health and Improved Mobility** **Chair: George A. Tsihrintzis**

Session WM.1	**Image and Video Processing**
Session Chair: **Nikolaos G. Bourbakis**	❖ *10:15-10:35* **Detection and Tracking Various Objects in Video Images** *A Young and Nikolaos Bourbakis* ❖ *10:35-10:55* **Texture Nano-Particles Detection in Subatomic Images** *A Shiveley and Nikolaos G. Bourbakis* ❖ *10:55-11:15* **Setting a Baseline for Long-shot Real-time Player and Ball Detection in Soccer Videos** *Konstantinos Moutselos and Ilias Maglogiannis* ❖ *11:15-11:35* **Hybrid Reduced-Reference Video Quality Assessment of Streaming Services over Reliable Transport** *Chulhee Lee* ❖ *11:35-11:55* **An Ontology-based Framework for Sports Media Data Interpretation** *Nikos Tsolakis, Nikolaos Vryzas, Charalampos Dimoulas, Christoniki Maga-Nteve, Georgios Meditskos, and Stefanos Vrochidis* ❖ *11:55-12:15* **No-Reference Image Sharpness Assessment based on Perceptually-Weighted Image Gradients** *Juan Andrade*
Session WM.2	**Privacy and Security**
Session Chair: **Evangelos Sakkopoulos**	❖ *10:15-10:35* **Harmonising Digital Identity Documents** *Anna Zafeiropoulou, and Evangelos Sakkopoulos* ❖ *10:35-10:55* **A Study on Human Perception of Document Paragraph Layout** *Benjamin Aziz and Aysha Bukhelli* ❖ *10:55-11:15* **Not-in-Perspective: Towards Shielding Google's Perspective API Against Adversarial Negation Attacks** *Michail Alexiou and Sukarno Mertoguno* ❖ *11:15-11:35* **Interoperability of Information Sources for Identification with Privacy Preservation and Early Fraud Detection** *Aikaterini Deligiannidou, Aggeliki Rapti, Zafeiria-Marina Ioannou, Emmanouil Viennas, Christos Papaloukopoulos, and Mersini Paschou* ❖ *11:35-11:55* **A Code-based Multiple Watermarking Scheme for the Preservation of Authenticity of Forensic Images** *Maria Chroni, Stavros D. Nikolopoulos, Iosif Polenakis, and Vasileios Vouronikos* ❖ *11:55-12:15* **Android Malware Detection in IoT Mobile Devices using a Meta-ensemble Classifier** *Gregory Davrazos, Theodor Panagiotakopoulos, Sotiris Kotsiantis, and Achilles Kameas*

Session WM.3	**Smart Energy**
Session Chair: **Miltos Alamaniotis**	❖ *10:15-10:35* **A Quantum Machine Learning Methodology for Precise Appliance Data Classification in Smart Grids** *Athanasios Ioannis Arvanitidis, Luis Valdez, and Miltos Alamaniotis* ❖ *10:35-10:55* **Distribution Grid-Compatible Renewable Energy through Optimal Exploitation of bottom-up Flexibility** *Konstantinos Seklos, Nikolaos Efthymiopoulos, Angelos Michalas, Dimitrios D. Vergados, and Dimitrios J. Vergados* ❖ *10:55-11:15* **Design of a New Photovoltaic Intelligent Monitoring and Control Device** *Deep Pujara, David Ramirez, Cihan Tepedelenlioglu, Devarajan Srinivasan, and Andreas Spanias* ❖ *11:15-11:35* **Energy Efficient Lighting Systems in Buildings Using Fuzzy Logic Control** *Dimitris Tsipianitis, Theodoros Giannopoulos and Georgios Mandellos* ❖ *11:35-11:55* **Flexibility Value Evaluation in Low-voltage Distribution Systems** *Jernej Zupancic* ❖ *11:55-12:15* **Investigation of Transfer Learning for Electricity Load Forecasting** *Vasileios Laitsos, Georgios Vontzos and Dimitrios Bargiotas*
Session WM.4	**Novel Methodologies in Data Analysis**
Session Chairs: **Vassilios Verykios** **and** **Dimitrios Panagoulias**	❖ *10:15-10:35* **An Experimental Evaluation of the Expectation Maximization Algorithm** *Dimitrios Karapiperis, Georgios Feretzakis and Vassilios Verykios* ❖ *10:35-10:55* **Exploring the Impact of the Signal-to-Noise Ratio Assumption on the Time Series Bootstrap Pairwise Dependence Hypothesis Test** *Themistoklis Koutsellis, Alexandros Nikas, Stylianos Choumas, Christopher Ververidis, Thomas Papapolyzos, Anastasios Bitsikas, Ioanna Makarouni, and Haris Doukas* ❖ *10:55-11:15* **Serial Dependence Analysis of Time Series Using Distance Correlation and Monte Carlo Bootstrap Hypothesis Test** *Themistoklis Koutsellis, Stylianos Choumas, Alexandros Nikas, , Christopher Ververidis, Thomas Papapolyzos, Anastasios Bitsikas, Ioanna Makarouni, and Haris Doukas* ❖ *11:15-11:35* **Enhancing k-NN Algorithm's Efficiency using Fuzzy AHP-based Composite Variables** *Panagiotis G. Giannopoulos, Thomas Dasaklis, Evangelos G. Maragkoudakis, and Gregory Chondrokoukis*

	❖ *11:35-11:55* **Detecting Anomalies in Multidimensional Time Series Using Cluster Analysis** *Mohammed Al-Gunaid, Maxim Shcherbakov, Vladimir Artyushin, Dmitry Shkolny, and Sergey Belov*
Session WA.1 Session Chairs: **Georgios Styliaras** **and** **Evangelos Sakkopoulos**	**Software Applications** ❖ *14:45-15:* **Promotion of food and touristic sustainable development in a lake environment using AR** *Georgios Styliaras, Victoria Dimou and George Kehayias* ❖ *15:05-15:25* **S1000d AppLicability dEpended pRocessiNg mOdel - SALERNO** *Theresia El Khoury, Georges Badr, Amir Hajjam El Hassani, and Stéphane N'Guyen Van Ky* ❖ *15:25-15:45* **How to Select Time Series Databases for an Insurance Company** *Irina Astrova and Arne Koschel* ❖ *15:45-16:05* **Semantic Cataloging of Public Services using Basic Government Vocabularies and the Data Catalog Vocabulary for a Unified European Digital Market** *Eleni Papadopoulou and Evangelos Sakkopoulos* ❖ *16:05-16:25* **Digital Technology Implementation in the Hospitality Industry and Hotel Star Rating: Does it matter? Evidence from Greece** *Maria Nikopoulou, Panagiota Chasapi, Panagiotis Kourouthanassis, and Adamantia Pateli*
Session WA.2 Session Chairs: **Maria Virvou** **and** **George A. Tsihrintzis**	**Rapidly Growing Artificial Intelligence Development and Applications in Education** ❖ *14:45-15:* **Is ChatGPT Beneficial to Education?: An Emerging Need for Holistic Evaluation Frameworks** *Maria Virvou and George A. Tsihrintzis* ❖ *15:05-15:25* **Assessing the Use of OpenAI ChatGPT in a University Department of Education** *Jim Prentzas and Maretta Sidiropoulou* ❖ *15:25-15:45* **A Conversational Digital Assistant for STEM Education** *Nikolaos Antonios Grammatikos, Evangelia Anagnostopoulou, Dimitris Apostolou, and Gregoris Mentzas* ❖ *15:45-16:05* **ChatGPT in Cultural Heritage AI -based e-Learning: The Case of Poems** *Maria Virvou, George Tsihrintzis, Dionisios Sotiropoulos, Evangelia-Aikaterini Tsichrintzi, Konstantina Chrysafiadi and Evangelos Sakkopoulos*

Session WA.3	Smart Cities
Session Chairs: **Dimitrios Bargiotas** **and** **Aspassia Daskalopulu**	❖ *14:45-15:* **Implementation of a small scale smart greenhouse structure using Fuzzy Logic and IoT** *Dimitris Tsipianitis, Fotios Tolis and Taxiarchis-Foivos Blounas* ❖ *15:05-15:25* **Data-driven Airport Multi-step Very Short-Term Load Forecasting** *Georgios Vontzos, Vasileios Laitsos, and Dimitrios Bargiotas* ❖ *15:25-15:45* **Explainability Analysis of Weather Variables in Short-Term Load Forecasting** *Dimitrios Kontogiannis, Dimitrios Bargiotas, Aspassia Daskalopulu, and Lefteri Tsoukalas* ❖ *15:45-16:05* **Data Mining for Smart Cities: Traffic Congestion Prediction** *Aristeidis Mystakidis, Olga Geromichalou, and Christos Tjortjis* ❖ *16:05-16:25* **Predicting Cost of Municipal Waste Management using IoT and Machine Learning** *Gregory Davrazos, Theodor Panagiotakopoulos, Sotiris Kotsiantis, and Achilles Kameas* ❖ *16:25-16:45* **ENCOVIZ: An open-source, secure and multi-role energy consumption visualisation platform** *Ilias Dimitriadis, Efstratios Voulgaris, Dimitrios Giakatos, Athena Vakali, Athanasios Papakonstantinou, and Dimitris Chatzigiannis*
Session WA.4	**TUTORIAL on** "Learning from Imbalanced Data"
Session Chair: **Leonidas Akritidis**	❖ *14:45-15:45* **"Learning from Imbalanced Data"**

16:45 – 17.00	**Closing Session (ROOM-1)** **Professor Maria Virvou**, University of Piraeus, Greece **Professor Dimitrios Bargiotas**, University of Thessaly, Greece **Professor Elpiniki Papageorgiou**, University of Thessaly, Greece **Professor George A. Tsihrintzis**, University of Piraeus, Greece **Professor Vasilis Gerogiannis**, University of Thessaly, Greece **Professor Miltiadis "Miltos" Alamaniotis**, University of Texas-San Antonio, USA

Conference Venue

IISA 2023 will be a live conference with Volos, Greece as its venue. Rooms and equipment are kindly provided by the Department of Electrical and Computer Engineering of the University of Thessaly, Greece. Please find a map to the IISA2023 venue and surrounding area at the backcover of this booklet.

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MAP OF IISA 2023 VENUE

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