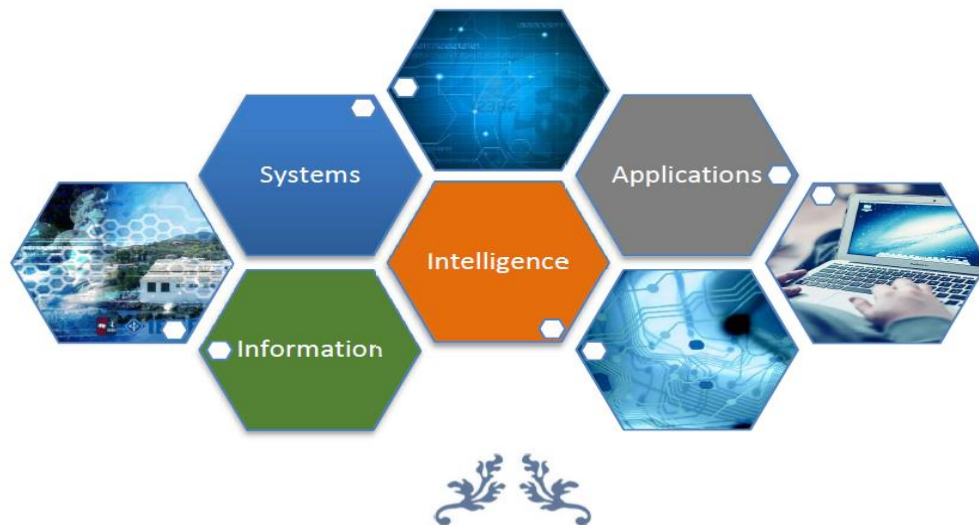M.Sc. in "Advanced Informatics and Computing Systems - Software Development and Artificial Intelligence"

M.Sc. in "Informatics"

The 15th International Conference on Information, Intelligence, Systems and Applications

17-20 July 2024, Chania, Greece

https://easyconferences.eu/iisa2024/

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 2024 Chairs' Message

Welcome to the Fifteenth International Conference on Information, Intelligence, Systems, and Applications (IISA 2024). **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 fifteenth IISA. IISA 2024 is organized by the University of Piraeus, Greece, Waseda University, Japan, the Technical University of Crete, Greece, EPU-National Technical University of Athens, Greece, and the Biological and Artificial Intelligence Foundation, USA. Technical sponsorship is also provided by the Institute of Electrical and Electronics Engineers (IEEE), the IEEE Computer Society and its Technical Community on Multimedia Computing, as well as by the Programs of Graduate Study in "Informatics" and "Advanced Information Systems" of the Department of Informatics, University of Piraeus, Greece. IISA 2024 is a live conference with Chania, Greece as its venue. IISA 2024 lasts for four days and its technical program consists of twenty-three (23) technical paper presentation sessions, two (2) keynote speeches, one (1) hourly tutorial presentation, three (3) roundtables, one (1) seminar, and one (1) award ceremony. We received 277 high quality submissions authored by authors-researchers from over 25 countries around the world. Out of them, eighty

(80) were accepted as full (eight-page) papers, which corresponds to an acceptance rate of 28,9%. An additional thirty-three (33) of the submissions were accepted as short (four-page) papers, which corresponds to 11,9% of the submissions. Moreover, accepted full and short paper authors represented academia, government, industry, and business.

We are thankful to the many people who contributed to the success of IISA 2024. Firstly, thanks are due to the paper authors, including those whose papers were not accepted in the program, for choosing IISA 2024 as the forum for dissemination of the results of their research. We are also thankful to the IISA 2024 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 2024. Thanks are also due to the University of Piraeus, Waseda University, the Technical University of Crete, EPU-National Technical University of Athens, 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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and the **Publicity Chairs**

Dr. Dimitrios Panagoulias, University of Piraeus, Greece

Dr. Elissaios Sarmas, National Technical University of Athens, Greece.

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

On behalf of the Fifteenth International Conference on Information, Intelligence, Systems, and Applications (IISA2024), we invite all of you to join us in Chania, Greece and enjoy the technical and the social program.

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- Papageorgiou Elpiniki, University of Thessaly, Greece
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- Washizaki Hironori, Waseda University, Japan
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- Yamaguchi Takahira, Keio Univ, Japan
- Yamamoto Shuichiro, International Professional University in Nagoya, Japan
- Yoshinori Tanabe, Tsurumi University, Japan

Invited Keynote Speakers

Vassilios S. Verykios, Hellenic Open University, Greece

Title: **Shadows and Silhouettes: Protecting Privacy in the Expansive Realm of Big Data**

Abstract:

As digital information increasingly dominates our lives, the boundaries of privacy are continuously challenged. This speech addresses the critical issues and ethical dilemmas surrounding privacy in the Big Data era. It explores the delicate balance between technological innovation and individual privacy rights, shedding light on the complexities of data collection, storage, and analysis. By advocating for robust privacy measures and responsible data practices, this discussion aims to chart a course toward protecting personal information in an ever-expanding digital world.

Short Bio:

Vassilios S. Verykios embarked on his academic journey with a Diploma from the University of Patras, followed by MSc and Ph.D. degrees from Purdue University. His career has seen a harmonious blend of teaching and research, from his early years as an Assistant Professor at the School of Information Science and Technology at Drexel University to his tenure at the University of Thessaly in Greece and the Hellenic Open University, where he now serves as a Professor and Director of the Graduate Program in Information Systems.

Prof. Verykios's research traverses the vast landscapes of Data Management, Data Mining, Big Data, Parallel Systems, and Educational Data Mining. With over 200 publications in esteemed journals and conferences, his work has illuminated the intricacies of data in the digital age, earning more than 10000 citations on Google Scholar. His monograph, "Association Rule Hiding for Data Mining," published by Springer, reflects his deep engagement with the ethical dimensions of data privacy.

His contributions extend beyond academia into the realm of international collaborations, with participation in projects funded by the Australian Research Council, Google, and SNF. He has consulted for leading tech companies and has been a visiting researcher at prestigious institutions, including CERIAS and the US Naval Research Laboratory.

Bill Kapralos, Ontario Tech University, Canada

Title: **Immersive Virtual Learning Environments (iVLEs) for Healthcare Education: Current state-of-of-art, and Open Problems**

Abstract:

Immersive virtual learning environments (iVLEs), serious games and virtual simulations in particular, allow trainees to learn from virtual simulated experiences in an interactive, engaging, and ethically safe manner. Although the use of iVLEs in healthcare education was steadily growing over the last 10-15 years, their use was accelerated during the COVID-19 pandemic as they played a significant role in facilitating remote learning during the pandemic-related-lockdowns. Within healthcare education, iVLEs are not so much technologies of the future but rather, of the present. Educators are finding innovative ways to leverage the coupling of iVLEs and emerging technologies such as extended reality (augmented, mixed, and virtual realities), and artificial intelligence (AI), to transform healthcare education. Despite the popularity of iVLEs and their potential in healthcare education, there are various limitations associated with their use that must be addressed. With a focus on healthcare education, this presentation will begin with an overview of iVLEs, and the various relevant emerging technologies they incorporate (XR and AI). A brief discussion regarding the limitations and potential solutions to these limitations will follow.

Bio:

Bill Kapralos is an Associate Professor within Game Development and Interactive Media program and the maxSIMhealth Laboratory at Ontario Tech University, and the Technical Lead of the Collaborative Human Immersive Interaction Laboratory, Sunnybrook Health Sciences Centre in Toronto. His current research interests include: immersive technologies, serious gaming, multi-modal virtual environments/simulation/reality, and spatial sound generation. He was recently awarded a Greek Diaspora Fellowship. He is a past recipient of an Australian Government 2018 Endeavour Executive Fellowship, a past recipient of a Natural Sciences and Engineering Research Council of Canada and Japan Society for the Promotion of Science Fellowship, a past recipient of an IBM Centres for Advanced Studies Faculty Award, and a past co-recipient of a Google Faculty Award.

Tutorial

Leslie Miller and Andreas Spanias, SenSIP Center, Arizona State University, USA

Title: **Image Fusion with Quantum Processing for Remote Sensing**

Abstract:

The integration of Synthetic Aperture Radar (SAR) and optical imagery through image fusion techniques is important in refining the accuracy and interpretability of images in remote sensing applications. The current array of available image fusion methods presents a complex landscape, each with its own set of advantages and limitations. This Tutorial will cover existing image fusion methods, with a primary focus on SAR and optical image classification. Furthermore, the tutorial will provide valuable insights for enhanced decision-making in remote sensing applications. In addition to examining image fusion methods, we will also present a study on various machine learning algorithms that can be used to classify the data. Although the emphasis is on SAR and optical image fusion, the study will also include a broader discussion of other applications, of image fusion methods across various domains. The tutorial is also accompanied by a survey paper that will be included in the proceedings of the conference.

Bio:

Leslie Miller is a PhD student in Electrical Engineering and a research associate with the SenSIP Center at Arizona State University. Her research interests are in signal processing, communication systems, and quantum computing. Leslie began her work in the SenSIP center laboratory in the summer of 2022. She has been an active graduate research associate and an NSF REU and NSF IRES recipient focused on exploring quantum computing algorithms for classifying remote sensing data. In addition to her work with the SenSIP center, she has completed three internships as a civilian engineer with the DoD. She also served as the President for the IEEE – Eta Kappa Chapter in 2023. She received the ASU Fulton Impact Award and was the convocation speaker for the ASU Fulton Schools in May 2023. Her quantum research was published at the IEEE Aerospace Conference and the IEEE DSP conference. Additionally, she has co-authored two provisional patents.

Andreas Spanias is a 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 (previously an NSF I/UCRC site). His research interests are in the areas of adaptive signal processing, speech processing, quantum machine learning, and sensor systems. He is the author of two textbooks:

Audio Processing and Coding by Wiley and DSP; An Interactive Approach (2nd Ed.). He has contributed to more than 350 papers, 11 monographs, 26 full patents, and several provisional patents. He served as Associate Editor of the IEEE Transactions on Signal Processing and as the 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 a Distinguished Lecturer for the IEEE Signal Processing Society. He received the 2018 IEEE Region 6 Outstanding Educator Award (across 12 states). In 2018, he was elected as a Senior Member of the National Academy of Inventors (NAI).

Program at a Glance

TIME	WEDNESDAY, JULY 17, 2024	THURSDAY, JULY 18, 2024	FRIDAY, JULY 19, 2024	SATURDAY, JULY 20, 2024
08:00 - 08:30	REGISTRATION	———	———	———
08:30 - 09:00	OPENING SESSION	———	———	———
09:00 - 10:00	**KEYNOTE – 1** / ROOM 1	**KEYNOTE – 2** / ROOM 1	**TUTORIAL** / ROOM 1	———
10:00 - 10:15	*COFFEE BREAK*	*COFFEE BREAK*	*COFFEE BREAK*	———
10:15 - 11:45	**WM-1** / ROOM 1 **WM-2** / ROOM 2 **WM-3** / ROOM 3	**TM-1** / ROOM 1 **TM-2** / ROOM 2 **TM-3** / ROOM 3	**FM-1** / ROOM 1 **FM-2** / ROOM 2	———
11:45 - 13:00	*LUNCH*	*LUNCH*	*LUNCH*	———
13:00 - 14:30	**WA-1** / ROOM 1 **WA-2** / ROOM 2 **WA-3** / ROOM 3	**TA-1** / ROOM 1 **TA-2** / ROOM 2 **TA-3** / ROOM 3	**FA-1** / ROOM 1 **FA-2** / ROOM 2 **FA-3** / ROOM 3	———
14:30 - 14:45	*COFFEE BREAK*	*COFFEE BREAK*	**CLOSING** / ROOM 1	———
14:45 - 16:15	**WE-1** / ROOM 1 **WE-2** / ROOM 2 **WE-3** / ROOM 3	**TE-1** / ROOM 1 **TE-2** / ROOM 2 **TE-3** / ROOM 3	———	———
17:30 – 19:00	———	———	———	**SEMINAR**
19:00 – 21:00	———	———	———	**AWARD CEREMONY & RECEPTION**
21.00 - 23.00	———	**BANQUET DINNER**	———	———

Detailed Program

<u>Wednesday, 17 July 2024</u>

08.30 – 09.00	**Opening Session (ROOM-1)** **Professor Hironori Washizaki, Waseda University, Japan** **Professor Maria Virvou, University of Piraeus, Greece** **Professor George A. Tsihrintzis, University of Piraeus, Greece** **Professor Vangelis Marinakis, National Technical University of Athens, Greece**
09.00 – 10.00	**Keynote Speech-1 (ROOM-1)** **Professor Bill Kapralos** **Immersive Virtual Learning Environments (iVLEs) for Healthcare Education:** **Current state-of-of-art and Open Problems** **Chair: George A. Tsihrintzis**

Session WM-1	**Healthcare – 1**

Session Chair:
 	
Aparna Varde
	❖ *10:15-10:30* **Audiovisual Multimodal Cough Data Analysis for Tuberculosis Detection**
	   Jyoti Yadav, Aparna Varde, Hao Liu, George Antoniou, Lei Xie
	
	❖ *10:30-10:45* **Integrating Cluster Analysis and Predictive Modeling for COVID-19 Treatment Outcomes: A Machine Learning Framework**
	Georgios Feretzakis, Aikaterini Sakagianni, Evgenia Paxinou, Vassilios S. Verykios
	
	❖ *10:45-11:00* **Medical Decision Support System in Nuclear Medicine Diagnosis for Non-Small Cell Lung Cancer and Coronary Artery Disease: A First Stage Prototype**
	   Agorastos Dimitrios Samaras, Elpiniki Papageorgiou, Anna Feleki, Ioannis Apostolopoulos, Serafeim Moustakidis, Konstantinos Kokkinos, Nikolaos Papandrianos
	
	❖ *11:00-11:15* **Investigating the agreement with human readers and generalisation capabilities of a transfer learning approach for predicting the malignancy of Solitary Pulmonary Nodules in CT screening**
	   Ioannis D. Apostolopoulos, Nikolaos Papathanasiou, Dimitris Apostolopoulos, Nikolaos Papandrianos, Elpiniki Papageorgiou
	
	❖ *11:15-11:30* **People Counting in Airports for COVID-19 Spreading Prevention using a Simple Computer Vision Algorithm**
	Evangelos Spyrou, Vassilios Kappatos

Session WM-2	**AI-infused Applications – 1: Image Analysis and Modeling**

Session Chair:
 	
Dionisios Sotiropoulos
	❖ *10:15-10:30* **Improving Active Face Recognition using Multi-Task Learning**
	Michail Loufakis, Pavlos Tosidis, Nikolaos Passalis, Anastasios Tefas
	
	❖ *10:30-10:45* **A Comparative Study of Face Morphing Algorithms**
	Dionisios Sotiropoulos, Aristotle Matakias
	
	❖ *10:45-11:00* **Weapon Recognition through Deep Learning**
	   Elena Acevedo, Antonio Acevedo, Sandra Gomez
	
	❖ *11:00-11:15* **Group AFFEct Recognition: The side of heartbeats**
	   Andreas M. Triantafyllou, George A. Tsihrintzis
	
	❖ *11:15-11:30* **Machine-Learning Modelling of a Fluid Flow in a Two-Dimensional Channel**
	Theofanis Aravanis, Grigorios Chrimatopoulos, Michalis Xenos, Efstratios Tzirtzilakis

Session WM-3	**Social Media Analytics and Applications**
Session Chairs:	*10:15-10:30* **Evolutionary and Quantum Computing for Community Detection: a Survey** *Clara Pizzuti*
Clara Pizzuti **and** **Michail Alexiou**	❖ *10:30-10:45* **Polarization and Misinformation: Anticipating Early Signs of Potential Fake News on Social Media** *Carmela Comito*
	❖ *10:45-11:00* **Analyzing the Impact of Preprocessing Techniques on the Efficiency and Accuracy of Sentiment Classification Algorithms** *Sai Nikhila Kanigiri, Chachi Mekuriyaw, Garrett Goodman, Michail Alexiou*
	❖ *11:00-11:15* **Topic Modeling-Driven Feature Engineering to Enhance Clickbait Detection in Social Networks** *Smita Ghosh, Shiv Jhalani, CJ Oshiro*
	❖ *11:15-11:30* **Comparing Pre-trained Transformer Models for Zero-Shot Text Categorization** *Isidoros Perikos, Konstantinos Kyritsis, Charalampos Liapis, Nikolaos Spatiotis, Michael Paraskevas*
	❖ *11:30-11:45* **Comparative Analysis of Movie Recommendation Systems Using Filtering Techniques on IMDB and Rotten Tomatoes** *Santosh Kumar Majhi, Preetipadma Sahani, Rosy Pradhan, Biswaranjan Acharya, Foteini Grivokostopoulou, Andreas Kanavos, Vassilis Gerogiannis*
Session WA-1	**Healthcare - 2**
Session Chair:	❖ *13:00-13:15* **AI-Based Suicide Risk Assessment** *Pavlos Charonyktakis, Grigoris Antoniou, Marios Adamou, Michael Doyle, Sotirios Batsakis, Ioannis Tsamardinos*
Sotirios Batsakis	❖ *13:15-13:30* **Using Explainable Machine Learning and Integrons to Predict Antimicrobial Resistance in Common Infection-causing Bacteria** *Zachary Lara, Geoffrey Solano*
	❖ *13:30-13:45* **AI-based Models for Predicting the Risk of Developing Diabetes** *Sotirios Batsakis, Bakhtiar Amen, Grigoris Antoniou, Steven Howard, Paul Rhys-Vivian, Gemma Gardner*
	❖ *13:45-14:00* **Effective Early Polyp Detection from Medical Images with YOLO-V7** *Filippos Iakovidis, Leonidas Akritidis, Panayiotis Bozanis*
	❖ *14:00-14:15* **Enhancing Cardiac AI Explainability through Ontology-based Evaluation** *Nikos Tsolakis, Christoniki Maga-Nteve, Stefanos Vrochidis, Nick Bassiliades, Georgios Meditskos*

Session WA-2	AI-infused Applications – 2: Data Analytics
Session Chairs: **Evangelos Sakkopoulos** **and** **Sotiris Kotsiantis**	❖ *13:00-13:15* **A Survey on Algorithms and Software for the Frequent Itemset Hiding Problem** *Panteleimon Krasadakis, Vassilios Verykios, Evangelos Sakkopoulos* ❖ *13:15-13:30* **Optimized Price Prediction of Cryptocurrencies using Deep Learning on High-Volume Time Series Data** *Gerasimos Vonitsanos, Andreas Kanavos, Foteini Grivokostopoulou, Spyros Sioutas* ❖ *13:00-13:45* **Robust and Scalable UAV Navigation: Implementing a Detect-and-Avoid Algorithm in ROS** *Isidoros Perikos, Ioannis Daramouskas, Niki Patrinopoulou, Vaios Lappas, Dimitrios Meimetis* ❖ *13:45-14:00* **Enhancing Predictive Maintenance with Interpretable AutoML: A Case Study on Detecting Ball-Bearing Faults using IoT Data** *Gregory Davrazos, George Raftopoulos, Theodor Panagiotakopoulos, Sotiris Kotsiantis, Achilles Kameas* ❖ *14:0-14:15* **Enhancing Occupancy Detection Through IoT: A Comparative Analysis of Classifiers** *Gregory Davrazos, George Raftopoulos, Theodor Panagiotakopoulos, Sotiris Kotsiantis, Achilles Kameas* ❖ *14:15-14:30* **Predictive Vigilance: Harnessing Internet of Things and Machine Learning for Smoke Detection** *Gregory Davrazos, George Raftopoulos, Theodor Panagiotakopoulos, Sotiris Kotsiantis*
Session WA-3	Advanced Machine Learning
Session Chair: **Natacha Targino**	❖ *13:00-13:15* **An Approach to Associate Provenance from ML Pipelines with Transparency and Accountability** *Natacha Targino, Damires Souza, Ana Carolina Salgado* ❖ *13:15-13:30* **qxSAX: an Adaptable Symbolic Aggregate Approximation for Class Balancing and Seamless Classification** *Joaquim Vinicius Carvalho Assunção, Eduardo Silveira* ❖ *13:30-13:45* **Recognition of Dog Motion States: Ensemble vs Deep Learning Models** *Georgios Davoulos, Iro Lalakou, Ioannis Hatzilygeroudis* ❖ *13:45-14:00* **Clustered-NSGA-II+: A multi-objective, evolutionary genetic algorithm for solving the ride-sharing problem with the same destination** *Emmanouil Bakiris, Charalampos Konstantopoulos* ❖ *14:00-14:15* **Benchmarking of Machine Learning Algorithms for Temperature Sensor Fault Time Series Classification**

	Konstantinos Prantikos, Maria Pantopoulou, Styliani Pantopoulou, Alexander Hefeitz, Lefteri Tsoukalas ❖ *14:15-14:30* **Incremental Clustering Approach based on DBSCAN Method and Weighted Feature for Medical Data** *Abir Smiti, Aymen Louati*
Session WE-1 Session Chairs: **Evgenia Psarra** **and** **Dimitris Apostolou**	**Healthcare - 3** ❖ *14:45-15:00* **An Analog Front-end for EEG Data Retrieval with High Noise Rejection** *Dimitris Tsipianitis, George Souliotis, Konstantinos Retsinas* ❖ *15:00-15:15* **A Multi-Layer Perceptron Neural Network-based Access Control Mechanism to Breast Cancer Patients' Health Data** *Evgenia Psarra, Dimitris Apostolou* ❖ *15:15-15:30* **A Neural Network-based Context Handling Mechanism for Accessing the Medical Information of Patient's suffering from Coronary Heart Disease** *Evgenia Psarra, Dimitris Apostolou* ❖ *15:30-15:45* **A Web-based Network Analysis Tool for the Metaganomic Analysis of Resistomes** *Geoffrey Solano, Zachary Lara* ❖ *15:45-16:00* **Kids Progress – Mobile Application to Identify Developmental Delays of 3-5 Years Children** *Dinushika Dodanthenna, Nadeesha Wickramarathna, Ridmi Wimalasiri, Nadun Wijenayaka, Jenny Krishara, Dinuka Wijendra*
Session WE-2 Session Chair: **Vassilios Verykios**	**AI-infused Applications – 3: Social and Critical Domains** ❖ *14:45-15:00* **Predicting Electoral Behavior from Homo Economicus in Contemporary Europe** *Maria Tolika, Rozita Tsoni, Dimitrios Karapiperis, Vassilios Verykios* ❖ *15:00-15:15* **Intelligent Smoothing and Cumulative Sum Control Methods Applied to Signal Peak Detection in Gamma-Ray Measurements** *Michael Squire, Miltos Alamaniotis* ❖ *15:15-15:30* **eCattle: A Platform for Traceability and Management of Livestock Transactions using Smart Contracts** *Nilton Júnior, Bruno Batista* ❖ *15:30-15:45* **Enhancing Efficiency and Quality of Services in the Public Service Sector of a Smart City, through State Fuzzy Cognitive Maps** *Andreas Polydoropoulos, Fotios Nestoras, Peter Groumpos*

	❖ *15:45-16:00* **Monitoring of Flow Rate Measurements using LSTM Autoencoder** *Styliani Pantopoulou, Maria Pantopoulou, Konstantinos Prantikos, Alexander Hefeitz, Lefteri Tsoukalas*
Session WE-3 Session Chair: **Miltiadis Alamaniotis**	**AI-infused Applications in the Energy Sector** ❖ *14:45-15:00* **Comparative Analysis of Artificial Intelligence Models for HVAC System Optimization in UNESCO Heritage Buildings** *Athanasios Arvanitidis, Carlos Faubel, Antonio Martinez-Molina, Miltiadis Alamaniotis* ❖ *15:00-15:15* ``**Transforming'' Electricity Demand Prediction** *Dionisios Sotiropoulos, Myrto Spatha* ❖ *15:15-15:30* **Power Consumption Assessment of Telecommunication Base Stations Harnessing Prototype Energy Models** *Athanasios Fevgas, John Korinthios, Panagiota Tsompanopoulou, Nikolaos Frangogiannis, Pelopidas Tsoumanis, George Paliaroutis, Alexandra Takou, George Stamoulis* ❖ *15:30-15:45* **Infrared Computer Vision for Utility-Scale Photovoltaic Array Inspection** *David Ramirez, Deep Pujara, Cihan Tepedelenlioglu, Devarajan Srinivasan, Andreas Spanias* ❖ *15:45-16:00* **Anchored Input-Output Encoding for improving the Performance of Temporal Convolutional Networks** *Anastasios Vafeidis, Maria Tzelepi, Anastasios Tefas* ❖ *16:00-16:15* **Performance Enhancement of Micro Hydro Power Plant with Improved Load Controller** *Poonam Syal*

Thursday, 18 July 2024

09.00 – 10.00	**Keynote Speech-2 (ROOM-1)** **Professor Vassilios Verykios** **Shadows and Silhouettes: Protecting Privacy in the Expansive Realm of Big Data** **Chair: Maria Virvou**

Session TM-1	**Data Analytics in the Energy Sector – 1: Smart & Energy Efficient Buildings**
Session Chairs: **Vangelis Marinakis,** **Elissaios Sarmas,** **Elena Boskov Kovacs,** **and** **Massimo Bertoncini**	❖ *10:00-10:05* **Welcome Speech** *Vangelis Marinakis* ❖ *10:05-10:30* **CRETE VALLEY: The First Renewable Energy Valley in Europe** *Elissaios Sarmas* **ENPOWER: Innovative Energy Communities' Schemes for Democratising the Energy Sector** *Elena Boskov Kovacs* **ENERSHARE: Energy Data Spaces for Trusted and Sovereign Data Sharing** *Massimo Bertoncini* ❖ *10:30-10:45* **Multi-criteria building performance assessment** *José L. Hernández, Serena Serroni, Efstathios Stamatopoulos, Elissaios Sarmas, Gian Marco Revel, Fredy Vélez* ❖ *10:45-11:00* **A web-based decision support tool for efficiently monitoring and upgrading HVAC systems** *Daniela Stoian, Evangelos Spiliotis, Efstathios Stamatopoulos, Elissaios Sarmas, Vangelis Marinakis* ❖ *11:00-11:15* **A holistic framework for evaluating energy performance and indoor environmental quality in cultural heritage buildings** *Sokratis Divolis, Evangelos Spiliotis, Vaggelis Marinakis* ❖ *11:15-11:30* **A smart toolbox for the digital transformation of buildings** *Sofía Mulero-Palencia, Susana Martín Toral, Dimitrios Rovas, Georgios Kormpakis, Vangelis Marinakis, Ali Vasallo Belver* ❖ *11:30-11:45* **A Comprehensive Approach to Real-time and Batch Processing for Energy-Efficient IoT Homes: Leveraging Lambda Architecture and Data Lakes** *Filippos Serepas, Ioannis Papias, Nikolaos Bellos, Vangelis Marinakis*

Session TM-2	**Rapidly Growing Artificial Intelligence Development and Applications - 1**
Session Chairs: **Maria Virvou** **and** **George A. Tsihrintzis**	❖ *10:15-10:30* **Mathematical Representation of Memory and Schema for Improving Human-Generative AI Interactions** *Dimitrios Panagoulias, Persephone Papatheodosiou, Anastasios Bonakis, Dimitrios Dikeos, Maria Virvou, George Tsihrintzis* ❖ *10:30-10:45* **Model Checking with Large Language Models – Initial Experiments and Future Directions** *Sotirios Batsakis, Ilias Tachmazidis, Matthew Mantle, Nikolaos Papadakis, Grigoris Antoniou* ❖ *10:45-11:00* **Developing an Anti-Phishing Large Language Model: A Focus Group Study on Human, Technological, and Legal Factors** *George Thomopoulos, Christos Fidas* ❖ *11:00-11:15* **Content Creation for Touristic Portals using ChatGPT** *Lampros Papantoniou, Eleni Voyiatzaki, Ioannis Hatzilygeroudis* ❖ *11:15-11:30* **Artificial Intelligence Chatbots and Social Robots in Education: Framework for Efficiency, Pedagogical and Ethical Requirements** *Maria Virvou, George Tsihrintzis*
Session TM-3	**Multimedia**
Session Chair: **Konstantina Chrysafiadi**	❖ *10:15-10:30* **Deep Learning-based Anomaly Detection in 5G Cellular Networks** *Umar Farooq, Aroosa Hameed, Aris Leivadeas, Ioannis Lambadaris* ❖ *10:30-10:45* **AI-Powered Spectrum Sensing Capabilities for Future Networks Beyond 5G** *Alexandru Lavric, Cristian Patachia-Sultanoiu, Razvan Marius Mihai, Partemie-Marian Mutescu* ❖ *10:45-11:00* **An Incremental Learning Assurance Approach for Intent-based Networking-enabled Data Centers** *Steve Lévesque, Xiaoang Zheng, John Violos, Aris Leivadeas, Matthias Falkner* ❖ *11:00-11:15* **Recent Advancements in Search-Engine Algorithms for Efficiency, Privacy and Security** *Jeremy Wolfe, Clark Pfohl, Hariharan Subramanian, J. Sukarno Mertoguno, Michail Alexiou* ❖ *11:15-11:30* **Reliability of CNN-Based No-Reference Video Quality Metrics** *Chulhee Lee* ❖ *11:30-11:45* **TopMoviePicks: A Personalized Movie Recommendation System Based on TOPSIS** *Evrydiki Vali-Sarafoglou, Konstantina Chrysafiadi*

Session TA-1 Session Chairs: **Vangelis Marinakis,** **Elissaios Sarmas,** **Elena Boskov Kovacs,** **and** **Massimo Bertoncini**	## Data Analytics in the Energy Sector - 2: Active, DR-Ready Buildings ❖ *13:00-13:15* **Methodology for assuring interoperability in demand-response services** *Susana Gutiérrez, José L. Hernández, Marzia Mammina, Luca Vitale, Alessandro Rossi* ❖ *13:15-13:30* **Aggregated Flexibility Dynamic Forecasting of Residential Energy Prosumers for DR Programs** *Ioannis Papias, Vasileios Michalakopoulos, Elissaios Sarmas, Vangelis Marinakis* ❖ *13:30-13:45* **A decision support tool for aggregation and prioritisation of energy efficiency investments in buildings** *Ioanna Andreoulaki, Daniela Stoian, Aikaterini Papapostolou, Andriana Stavrakaki, Vangelis Marinakis* ❖ *13:45-14:00* **Spotlighting the significance of the SRI methodological tailoring at country level: a case study in Greece** *Apostolos Arsenopoulos, Efstathios Stamatopoulos, Panagiotis Samaras, Georgios Xexakis, John Psarras* ❖ *14:00-14:15* **Utilizing Extended Digital Twins to Enable Interactive Business Intelligence Services in Prefabricated Building Components Manufacturing Facilities** *Laura Vandi, Alessandro Pracucci, Chiara Maria Capizzi, Miloš Crvić*
Session TA-2 Session Chairs: **Maria Virvou** **and** **George A. Tsihrintzis**	## Rapidly Growing Artificial Intelligence Development and Applications – 2 ❖ *13:00-13:15* **Evaluating non-Expert Stakeholder Interaction with Artificial Intelligence on Energy Urban Domain using VIRTSI: The Case of ChatGPT** *George A. Tsihrintzis, Elissaios Sarmas, Vangelis Marinakis, Dimitrios Panagoulias, Evangelia-Aikaterini Tsichrintzi, Maria Virvou* ❖ *13:15-13:30* **Impact of Consequences on Human Trust Dynamics in Artificial Intelligence Responses** *Maria Virvou, George A. Tsihrintzis* ❖ *13:30-13:45* **AI in Smart Tourism: LLMs & GPTs Leading the Way** *Aristea Kontogianni, Efthimios Alepis* ❖ *13:45-14:00* **Metaverse vs Descartes: Free Will and Determinism All Over Again** *Leonie Hallo, Caroline Rowe, Gergely Duh*

Session TA-3	**Educational Informatics**
Session Chairs: **Evgenia Paxinou** **and** **Vassilios Verykios**	❖ *13:00-13:15* **Decoding Students' Paths in Moodle to Distill Significance of Learning Resources** *Evgenia Paxinou, Georgios Feretzakis, Rozita Tsoni, Dimitrios Karapiperis, Dimitrios Kalles, Vassilios S. Verykios* ❖ *13:15-13:30* **An automated text summarization approach for open-ended responses in student online surveys** *George Vorvilas, Despoina Pantazi, Evgenia Paxinou, Georgios Feretzakis, Dimitrios Kalles, Nikos Karousos, Achilles Kameas, Vassilios S. Verykios* ❖ *13:30-13:45* **Adaptive Learning in Mobile Serious Games: A Personalized Approach Using AI for General Knowledge Quizzes** *Michail Tselepatiotis, Efthimios Alepis* ❖ *13:45-14:00* **Mentoring Mastery: Methodological Strategies for Adult Trainer Empowerment in DigComp Framework Application** *Natalia Spyropoulou, Rozalia Kalantzi, Achilles Kameas, Iosif Fragkoulis, Theodora Papageorgiou* ❖ *14:00-14:15* **Transforming Competence Frameworks into Practice: A methodological guide to online course development for educator competence enhancement** *Natalia Spyropoulou, Chara Tapeinou, Achilles Kameas, Georgia Sakellaropoulou* ❖ *14:15-14:30* **A methodology for collecting, processing and validating team members' contribution data in the academic environment** *Ioannis Katsenos, Christos Pierrakeas*
Session TE-1	**Big Data Analytics in the Energy – 3: Energy Communities & Democritisation**
Session Chairs: **Vangelis Marinakis,** **Elissaios Sarmas,** **Elena Boskov Kovacs,** **and** **Massimo Bertoncini**	❖ *14:45-15:00* **ESG Criteria in Investment Decision Making: Trends and Perspectives** *Eleni Kanellou, Michaela Sarri, Konstantina Zoumpoulaki, Konstantinos Koasidis, Vangelis Marinakis, Haris Doukas, Alexandros Nikas* ❖ *15:00-15:15* **Knowledge Graph Model for Computational Continuum over Smart Grid** *Ioana Ramona Martin, Tudor Cioara, Gabriel Arcas, Ionut Anghel, Massimo Bertoncini* ❖ *15:15-15:30* **Democratise energy through energy activated citizens and data driven communities: The ENPOWER approach** *Nektarios Matsagkos, Eleni Kanellou, Afroditi Fragkiadaki, Vasilis Michalakopoulos, Vangelis Marinakis, Haris Doukas* ❖ *15:30-15:45* **Assessing the impact of Circular economy projects: the DEFINITE-CCRI approach** *ELeni Kanellou, Evi Makri, Nikolai Jacobi, Alexandros Nikas, Haris Doukas* ❖ *15:45-16:00* **Future Heat Risk Index The case of Attica Regions, Greece**

	Iason C. Dimitriou, Georgios P. Trachanas, Apostolis Arsenopoulos, Elissaios Sarmas
	❖ *16:00-16:15* **A Multi-Criteria Decision Analysis tool to support participatory ranking of regional energy priorities under the EE1st principle** *Georgios Konstantopoulos, Andriana Stavrakaki, Vlasios Oikonomou, John Psarras*
	❖ *16:15-16:30* **A Multi-Criteria Decision Support Tool for the Evaluation of Energy Storage Systems: A Case Study in Battery Technology** *Georgios P. Trachanas, Apostolos Arsenopoulos, Theodoros Tsalidis, Filippos Serepas, Ourania Markaki, Dimitrios Askounis*
	❖ *16:30-16:45* **Conclusions**
Session TE-2 Session Chairs: **Eleni Stroulia** **and** **Dimitrios Tsolis**	**Intelligence in Digital Humanities** ❖ *14:45-15:00* **Virtual-GymVR: A Virtual Reality Platform for Personalized Exergames** *Victor Fernández Cervantes, Eleni Stroulia* ❖ *15:00-15:15* **eXtended Reality services for Outdoor Cultural Spaces: System Design and Evaluation Framework using Unbiased Biometric Data** *Zois Koukopoulos, Dimitrios Koukopoulos, Christos Fidas* ❖ *15:15-15:30* **Towards an Automated Cultural Heritage Data Processing and Publishing Pipeline** *Vasileios Triantafyllou, Dimitrios Tsolis* ❖ *15:30-15:45* **Mathematics Anxiety and the Mozart Effect: A Comparative Study on Emotional Intelligence in Mathematics E-learning Among Music and General Education Students** *Dimitrios Zarkadoulas, Maria Virvou* ❖ *15:45-16:00* **LYRICEL: A Rule-Augmented Artificial Intelligence-empowered Cultural e-learning with GPT and Machine Learning for Song Lyrics** *Dimitrios Panagoulias, Dionisios Sotiropoulos, Konstantina Chrysafiadi, Evangelia-Aikaterini Tsichrintzi, Evangelos Sakkopoulos, George A. Tsihrintzis, Maria Virvou*

Session TE-3	**Cognitive Cloud Continuum**
Session Chair: **Dimitris Apostolou**	❖ *14:45-15:00* **Federated Learning in Multi Clouds and resources constraint devices at the Edge** *Vasileios Angelos Stefanidis, Yiannis Verginadis, Gregoris Mentzas* ❖ *15:00-15:15* **Evaluation of Cloud Continuum Computing Resources: A Mathematical Programming approach** *Gregory Koronakos, Dimitris Apostolou, Yiannis Verginadis, Andreas Tsagkaropoulos, Ioannis Patiniotakis, Gregoris Mentzas* ❖ *15:15-15:30* **KEENsight: Cloud based Collaborative Environment for Streamlining Machine Learning Development** *Lincoln Sherpa, Sima Attar-Khorasani, Rajasekar Sankar, Ralph Müller-Pfefferkorn, Siavash Ghiasvand*

Friday, 19 July 2024

09.00 – 10.00	**Tutorial (ROOM-1)** **Leslie Miller and Professor Andreas Spanias** **Image Fusion with Quantum Processing for Remote Sensing** **Chair: Dimitrios P. Panagoulias**

Session FM-1 Session Chair: **Leonie Hallo**	**Impact of the Metaverse and Artificial Intelligence on Management Decision-Making** ❖ *10:15-10:30* **Identity and Digital Self-Representation in the Metaverse** *Leonie Hallo, Myrto Dimitriou* ❖ *10:30-11:45* **Roundtable discussion** *Leonie Hallo, Caroline Rowe, Richa Gulati, Nguyễn Văn Tiếp, Andrew West, Myrto Dimitriou, Anastasia (Natasha) Hanzis*
Session FM-2 Session Chair: **Loukas Ilias**	**Artificial Intelligence Methods for Understanding Complex Brain Disorders** ❖ *10:15-11:45* **Roundtable discussion** *Christos Ntanos, Elissaios Karageorgiou, Ioannis Stavropoulos, Emily Adrion, Loukas Ilias, Theodosios Pountridis, Vangelis Lamprou, Konstantinos Alexakis*
Session FA-1 Session Chair: **Nikolaos G. Bourbakis**	**AI-infused Applications – 4: IOT and Smart Ecosystems** ❖ *13:00-13:15* **Smart Garbage Separators: A Comparative Evaluation** *D. Tummala, S.Vemula, V.Yamalanchili, C.C. Venigalla, M.Veerepalli, and N. Bourbakis* ❖ *13:15-13:30* **Smart Recycle Bin based on Machine Learning and Multi Sensoring** *Georgios Mandellos, Dimitris Tsipianitis, Ioannis Gkini, Griseld Gkini* ❖ *13:30-13:45* **Real-time monitoring for an IoT-based Aquatic Microecosystem** *Dimitris Tsipianitis, Maria Filippou* ❖ *13:45-14:00* **Agricultural Product Traceability using Blockchain-based Digital Product Passports** *Christoforos-Nikitas Kasimatis, Dimitris Apostolou, Aspasia Efthimiadou, Gregoris Mentzas* ❖ *14:00-14:15* **Applicability Filtering Model for S1000D documents using AND/OR trees** *Theresia El Khoury, George Badr, Amir Hajjam El Hassani, Stéphane N'Guyen Van Ky* ❖ *14:15-14:30* **Applying LSTM for River's Water Level Forecasting as Potential Flood Indication: A Case Study in Greece** *Theodoros Tziolas, Elpiniki Papageorgiou, Konstantinos Papageorgiou, George Zardas, Panagiotis Papazoglou*

Session FA-2	**AI and Software Development**
Session Chair:	❖ *13:00-13:15* **AI Engineering Continuum: Concept and Expected Foundation** *Hironori Washizaki, Nobukazu Yoshioka*
Dimitrios Panagoulias	❖ *13:15-13:30* **Developer-Centric Task Allocation: An Intelligent Approach for Enhanced Software Productivity** *Evandro Luis da Rosa Fensterseifer Filho, Joaquim Assunção, Lisandra M. Fontoura*
	❖ *13:30-13:45* **Challenges of Ensuring Software Accessibility: an Approach to Developing Mobile Applications for People with Intellectual Disabilities** *Vladislav Guryev*
	❖ *13:45-14:00* **Integration of Security in the DevOps Methodology** *Emmanouil Sermpezis, Dimitrios Karapiperis, Christos Tjortjis*
Session FA-3	**Policies and Financing in Smart Energy Applications**
Session Chair:	❖ *13:00-13:15* **AI-Based Modeling for Textual Data on Solar Policies in Smart Energy Applications** *Sarahana Shrestha, Isabele Bittencourt, Aparna Varde, Pankaj Lal*
Miltos Alamaniotis	❖ *13:15-13:30* **Enhancing Green Financing through AI Analytics and Cross-Domain Data Sharing** *Ioannis Papagiannopoulos, Christos Ntanos, Sotiris Pelekis, Alexandros Menelaos Tzortzis, Hercules Koutalidis, Evangelos Karakolis, Georgios Kormpakis, Eugenia Skepetari, Ariadni Michalitsi-Psarrou, Afroditi Blika, Dimitris Askounis*
	❖ *13:30-13:45* **Towards innovative power-to-gas investments in Greece: Novel simulation scenarios and assessment framework** *Hercules Koutalidis, Sotiris Pelekis, Eugenia Skepetari, Christos Ntanos, Evangelos Karakolis, Alexandros Menelaos Tzortzis, Georgios Kormpakis, Ariadni Michalitsi-Psarrou, Ioannis Papagiannopoulos*
	❖ *13:45-14:00* **Spot Price Prediction in Electricity Markets Using an Ensemble of Extreme Learning Machines** *Joshua Ramirez, Sara Ahmed, Miltos Alamaniotis*
	❖ *14:00-14:15* **SESAR GEESE Project Validation with CIRA Multi-Agent Simulation Facility: preliminary study** *Francesco Gargiulo, Gabriela Gigante, Oriol Bracons Escarrè, Tomàs de Urrengoechea Cantavenera*
	❖ *14:15-14:30* **Developing Smart EES: A Comprehensive Solution for Enhanced Energy Efficiency in the EU** *Jiří Karásek, Olha Khabatiuk, Jan Pojar*

Saturday, 20 July 2024

14:30 – 14.45	**Closing Session (ROOM-1)** **Professor Hironori Washizaki, Waseda University, Japan** **Professor Maria Virvou, University of Piraeus, Greece** **Professor George A. Tsihrintzis, University of Piraeus, Greece** **Professor Vangelis Marinakis, National Technical University of Athens, Greece**

	SEMINAR, AWARD CEREMONY AND RECEPTION
Session Chairs: **Maria Virvou** **and** **George A. Tsihrintzis**	❖ *17:30-19:00* **Seminar: Job Opportunities Requiring AI Expertise** **SMART WEARABLE SYSTEMS FOR PEOPLE'S HEALTH & SPECIAL NEEDS** *Prof. Nikolaos G. Bourbakis, Purdue University,* *Technical University of Crete, Biological and Artificial* *Intelligence Foundation* **AI-EMPOWERED DECISIONS SUPPORT SYSTEMS** *Prof. George A. Tsihrintzis, University of Piraeus* **LARGE LANGUAGE MODELS** *Prof. Maria Virvou, University of Piraeus* ❖ *19:00-21:00* **Award Ceremony and Reception**

Conference Venue

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