IEEE CITS 2022

2022 International Conference on Computer, Information and Telecommunication Systems

Will Be Held Virtual
July 13-15, 2022
All Times are based on Athens, Greece Local Time

Technical Sponsors:

IEEE

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CITS 2022 General Chairs' Message

Welcome to the 2022 International Conference on Computer, Information and Telecommunication Systems (CITS 2022). This year's conference marks the 11th anniversary of CITS, which is being held on annual basis.

CITS 2022 offers a unique forum for researchers and practitioners from academia, industry, business, and government to share their expertise results and research findings in all areas of Computer, Information and Telecommunication Systems.

This year's conference includes an outstanding technical program, and four distinguished keynote speakers. We planned to have the conference to be held in Athens-Piraeus, Greece, but due to COVID-19 situation, we will hold it virtual.

CITS 2022 technical program consists of several technical tracks. Each track consists of several sessions of top-quality papers. The topics covered in the program include, computer networks, wireless networks, wireless sensor networks, telecommunications, cyber security, Artificial Intelligence (AI), machine learning, information security, cell network systems, data analytics/science, parallel and distributed computing, databases and data mining, hardware/architecture/real-time systems, MIMO systems, modeling and simulation, performance evaluation, digital signal processing, image processing, pattern recognition, multimedia systems and video processing, neural networks, deep learning, cloud computing, web systems, security and information assurance, algorithms, e-services and e-business, and collaborative learning systems, among others.

This year, we received a large number of quality papers. Only very high-quality papers have been accepted. The acceptance ratio is 47.8 %. This is an indicative of the diligent work of the senior program chair, program committee chairs, technical program committee members and reviewers. The accepted papers come from all over the World with representation from academia, industry, business and government. Moreover, accepted papers will appear in IEEE Xplore and SCOPUS.

Many individuals have contributed to the success of this high caliber international conference. Our sincere appreciation goes to all authors including those whose papers were not included in the program. Many thanks are also due to our distinguished keynote speakers for their valuable contribution to the conference.

Special thanks are also due to the senior program chair, Prof. Petros Nicopolitidis, for his outstanding role in leading the technical program efforts. Thanks also are due to the other program chairs. Many thanks also go to the technical program committee members and reviewers for their timely work and efforts.

Special thanks go to the publication chairs and assistant general chair, Dr. Yu Guo for his outstanding work and dedication. Thanks to our dedicated Webmaster Antonio Bueno for his great and reliable work. Special thanks go to the international publicity committee members and international liaisons for their excellent work.

Special thanks are due to the international steering committee of the CITS. We also like to thank the IEEE Communication Society for technical co-sponsorship of the conference.

Finally, on behalf of the 2022 IEEE International Conference on Computer, Information and Telecommunication Systems (CITS 2022), we invite all of you to enjoy the program.

Prof. Mohammad S. Obaidat, General Chair, Life Fellow of IEEE, Fellow of SCS, Past President of the Society for Modeling & Simulation International (SCS), Founding Editor in Chief, Wiley Security and Privacy Journal, Editor in Chief, International Journal of Communication Systems, Recipient of SCS Hall of Fame Award, Recipient of the Technical Achievement Award from IEEE ComSoc-Technical Committee on Communication Software

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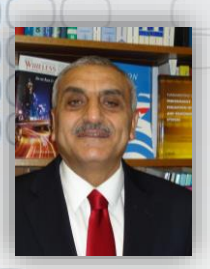

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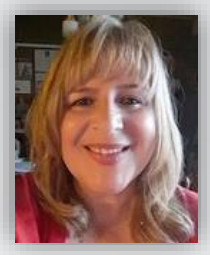

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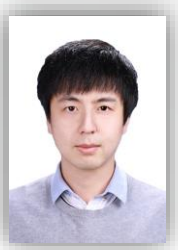

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Program At a Glance
All Times Listed here are Based on Greece Local Time

Wednesday, July 13		Thursday, July 14		Friday, July 15	
Join Zoom Meeting: *		Join Zoom Meeting: *		Join Zoom Meeting: *	
Meeting ID: *		Meeting ID: *		Meeting ID: *	
Passcode: *		Passcode: *		Passcode: *	
11:00-11:30	Opening Session	11:00-11:45	Keynote Speech 5	11:00-12:30	Computer Systems
11:30-12:15	Keynote Speech 1	11:45-12:30	Keynote Speech 6	12:30-14:00	Networking
12:15-13:00	Keynote Speech 2	12:30-12:45	Break	14:00-14:15	Break
13:00-13:15	Break	12:45-13:30	Keynote Speech 7	14:15-15:45	Telecommunications
13:15-14:00	Keynote Speech 3	13:30-15:00	Information Technology 1	15:45-16:15	Closing Session
14:00-14:45	Keynote Speech 4	15:00-15:15	Break		
		15:15-16:45	Information Technology 2		
		16:45-18:15	Information Technology 3		

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Schedule

Wednesday, July 13

Daily Program Chair: George A. Tsihrintzis

11:00 - 11:30

Opening Session

11:30 - 12:15

Keynote Speech 1

Artificial Intelligence in Cloud/Fog/Edge Computing and Internet-of-Things
Session Chair: George Tsichrintzis

Distinguished Keynote speaker: Prof. Vincenzo Piuri, Department of Computer Engineering, University of Milan, Italy

Recent years have seen a growing interest among users in the migration of their applications to the Cloud/Fog/Edge computing and Internet-of-Things environments. However, due to high complexity, Cloud/Fog/Edge-based and Internet-of-Things infrastructures need advanced components for supporting applications and advanced management techniques for increasing the efficiency. Adaptivity and autonomous learning abilities become extremely useful to support configuration and dynamic adaptation of these infrastructures to the changing needs of the users as well as to create adaptable applications. This self-adaptation ability is increasingly essential especially for non-expert managers as well as for application designers and developers with limited competences in tools for achieving this ability. Artificial intelligence is a set of techniques which greatly can improve both the creation of applications and the management of these infrastructures. This talk will discuss the use of artificial intelligence in supporting the creation of applications in cloud/fog/edge and IoT infrastructures as well as their use in the various aspects of infrastructure management.

Bio

Vincenzo Piuri has received his Ph.D. in computer engineering at Polytechnic of Milan, Italy (1989). He is Full Professor in computer engineering at the University of Milan, Italy (since 2000). He has been Associate Professor at Polytechnic of Milan, Italy and Visiting Professor at the University of Texas at Austin, USA, and visiting researcher at George Mason University, USA.

His main research interests are: artificial intelligence, computational intelligence, intelligent systems, machine learning, pattern analysis and recognition, signal and image processing, biometrics, intelligent measurement systems, industrial applications, digital processing architectures, fault tolerance, cloud computing infrastructures, and internet-of-things. Original results have been published in 400+ papers in international journals, proceedings of international conferences, books, and book chapters. He is Fellow of the IEEE, Distinguished Scientist of ACM, and Senior Member of INNS. He is IEEE Region 8 Director-elect (2021-22), will be IEEE Region 8 Director (2023-24), and has been IEEE Vice President for Technical Activities (2015), IEEE Director, President of the IEEE Systems Council, President of the IEEE Computational Intelligence Society, Vice President for Education of the IEEE Biometrics Council, Vice President for Publications of the IEEE Instrumentation and Measurement Society and the IEEE Systems Council, and Vice President for Membership of the IEEE Computational Intelligence Society.

He has been Editor-in-Chief of the IEEE Systems Journal (2013-19). He is Associate Editor of the IEEE Transactions on Cloud Computing and has been Associate Editor of the IEEE Transactions on Computers, the IEEE Transactions on Neural Networks, the IEEE Transactions on Instrumentation and Measurement, and IEEE Access.

He received the IEEE Instrumentation and Measurement Society Technical Award (2002) and the IEEE TAB Hall of Honor (2019). He is Honorary Professor at: Obuda University, Hungary; Guangdong University of Petrochemical Technology, China; Northeastern University, China; Muroran Institute of Technology, Japan; Amity University, India; Galgotias University, India; Chandigarh University; and BIHER, India.

12:15 - 13:00

Keynote Speech 2

User Experience of AI over the Internet: Emerging Paradigms
Session Chair: Efthimios Alepis

Distinguished Keynote speaker: Prof. Maria Virvou, Department of Informatics, University of Piraeus, Greece.

Artificial Intelligence (AI)-empowered software is leading people's work and everyday life into a new era in which computers not only execute human instructions, but also act as agents and undertake decision making roles. Current AI paradigms, such as deep learning, machine learning, decision making methods, cognitive theories, fuzzy logic and more, have proven instrumental in acquiring more meaning from big data, guiding people to unexplored domains in cyberspace, and assisting humans in both cognitive and labour work that needs accuracy and sensors which perform intelligent analysis. One of the reasons that AI itself has grown enormously is the evolution of Internet technologies that allow big chunks of data to be transferred everywhere thereby assisting in the accumulation of masses of information and contributing to the operation of computers using the help of satellites and large clouds in all sorts of interactive applications. Such smart applications include smartphones, wearables, self-driving cars, smart homes, and offices, virtual personal assistants, robots, as well as applications contributing to the evolution of human accomplishments in science and arts. The previous give rise to a new kind of human-machine interaction, namely human-AI interaction, in which human nature, capabilities, understanding, feelings, and needs remain unchanged while receiving plethora of new assistive technological advancements and constitute the most important issue in the two-part dialogue, urging for more research on trustworthy and explainable AI. This talk will highlight important advantages and gains and will discuss consequent challenges of the emerging human-AI interaction era over the Internet. The state-of-the-art in this area will be reviewed and the author's personal point of view will be presented through examples of research as to how this interaction can acquire more explainability, interpretability and trustworthiness to lead humans to desired levels of positive user experience in the emerging paradigms of the new human- AI dialogue.

Bio

Professor - Dr. Maria Virvou was born in Athens, Greece. She received a B.Sc. Degree in Mathematics from the National and Kapodistrian University of Athens, Greece, a M.Sc. Degree in Computer Science from the University College London (UCL), U.K. and a Ph.D. Degree in Computer Science and Artificial Intelligence from the University of Sussex, U.K. Her postgraduate and doctoral studies were funded by a scholarship obtained from the Greek State Scholarship Foundation.

She is currently a FULL PROFESSOR, HEAD OF THE DEPARTMENT, DIRECTOR OF POST-GRADUATE STUDIES and DIRECTOR OF THE SOFTWARE ENGINEERING LAB in the Department of Informatics, University of Piraeus, Greece. She is AUTHOR/CO-AUTHOR of over 350 research papers published in international journals, books and conference proceedings and of 7 books and monographs in Computer Science. She has been EDITOR of over 30 collections of papers in conference proceedings or books, published by major academic publishers, such as IEEE, Springer and IOS Press. She is currently EDITOR-IN-CHIEF of the Springer book series "Learning and Analytics in Intelligent Systems" and "Artificial Intelligence-enhanced Software and Systems Engineering". She has also been EDITOR-IN-CHIEF of the SpringerPlus Journal (Springer) for the whole area of Computer Science. Additionally, she has been an ASSOCIATE EDITOR of many other journals. She has been GENERAL CO-CHAIR of the yearly conference series of International Conference on Information, Intelligence, Systems and Applications (IISA 2013-2022), technically-sponsored by IEEE, which aims at promoting research in the area of interactive multimedia and major applications. She has been the GENERAL CHAIR / PROGRAM CHAIR of over twenty (20) International Conferences. She has been the PRINCIPAL INVESTIGATOR or CO-INVESTIGATOR of numerous national / international research projects. She has supervised 12 Ph.D. alumni and many of them currently hold academic positions in Universities. She has been teaching under-graduate and postgraduate courses in Educational Software, Software Engineering and Mobile Software, Human Computer Interaction, Programming Languages and Compilers, Software Personalization Technologies, User Modeling, Adaptive Tutoring Systems.

Prof.-Dr. Virvou has been a recipient of many best paper awards in international conferences. She has been an invited keynote speaker for many international conferences. She has received an honorary award by UNESCO in honour and recognition of her outstanding scholarly achievements and contributions to the field of Computer Science. She received the 1st Research Award from the Research Centre of the University of Piraeus for high quality international journal publications among Faculty Members of the University of Piraeus for the years 2004-2005 and 2005-2006 respectively. According to Microsoft Academic Search exploring entity analytics of 262,751,231 authors she has been ranked as top 1st author in the Computer Science area of EDUCATIONAL SOFTWARE regarding citations and 2nd regarding publications. In addition, she has been ranked as top 1st author in publications in the Computer Science areas of MOBILE AUTHORING TOOLS, ADAPTIVE TUTORING, BI-MODAL AFFECTIVE COMPUTING, INTELLIGENT HELP, AUTOMATIC REASONING HELP, EDUCATIONAL GAME SOFTWARE, VIRTUAL REALITY EDUCATIONAL GAME, RUP LIFE CYCLE SOFTWARE. She has been ranked as 2nd top author regarding publications in the areas of SOFTWARE PERSONALIZATION STUDENT MODELING, INTELLIGENT HELP SYSTEMS FOR UNIX USERS, KNOWLEDGE ENGINEERING AFFECTIVE SYSTEMS, top 4th author in the area of UML INTELLIGENT COLLABORATIVE LEARNING and top 5th in the whole area of USER MODELING. Moreover she has been ranked among the top 40 researchers worldwide in publications for the Computer Science area of MULTIMEDIA (out of 979.432 publications, 8.626.011 citations, 1.600.000 authors), among the top 50 authors in the area of USER INTERFACE (out of 176.156 publications, 3.462.738 citations) and among the top 65 authors in HUMAN COMPUTER INTERACTION (out of 538.396 publications, 6.497.244 citations). She is among the top 2% of the most influential scientists worldwide in the area of ARTIFICIAL INTELLIGENCE, according to Ioannidis, J. P., Boyack, K. W., & Baas, J. (2020) "Updated science-wide author databases of standardized citation indicators", PLoS Biology, 18(10), e3000918.

13:00 - 13:15

Break

13:15 - 14:00

Keynote Speech 3

Digital Medicine: challenges and opportunities ahead
Session Chair: Petros Nicopolitidis

Distinguished Keynote speaker: Prof. Panagiotis Bamidis, School of Medicine, Aristotle University of Thessaloniki, Greece

Contemporary challenges of modernising healthcare and facing urgencies and pandemics have been much driven around evolutions in Digital Medicine. Transparent and ubiquitous monitoring while respecting the needs for personal privacy and data confidentiality haven all been set in a race for creating new digital biomarkers and evidence-based decision support and best-practice recommendations. In this race, many of the key societal and medical problems have been in focus, with some already interesting results, while anticipating many more soon. In this talk, light is shed on the overall healthcare environment which is also driven by the urgent need to create digital solutions allowing for a wider notion of a "topical resiliency" in the sense that any healthcare practice as well as healthcare workforce training should be topically allowing for "One-Health" ideas, as well as affording up-skilling. In this talk, numerous examples from running a handful of projects will be provided.

Bio

Panagiotis Bamidis is a Professor of Medical Physics, Informatics and Medical Education and Director of the Lab of Medical Physics and Digital Innovation in the School of Medicine of the Aristotle University of Thessaloniki (AUTH), Greece. He designs, implements, and evaluates IT and Assistive Technologies systems that improve everyday activities of elderly or other vulnerable groups and improves their health or life quality or improves the education and training of health professionals. He conducts research that attempts to understand how the brain reacts to different stimuli, technological or educational interventions, as well as, the development and evolution of human emotions and sleep transitions. Co-creation and Living Lab approaches are within his active interests. He is the co-ordinator of ten large European projects, and the principal investigator for many national and international funded projects. He is the President of the Hellenic Biomedical Technology Society, HL7 Hellas, the international Society of Applied Neuroscience, a member of the Administration Boards of other societies and patient associations, the Chairman/Organiser of some 20 international conferences and several national Biomedical Technology conferences. Since 2012 he has established LLM Care ecosystem (www.llmcare.gr), the business exploitation of the LLM project, which is a two-star reference site of the EIP-on-AHA. In 2013 he established the Active and Healthy Ageing Living Lab in Thessaloniki (ThessAHALL; http://www.aha-livinglabs.com/) which in 2018 became a full member of the European Network of Living Labs (ENoLL). In 2017, he became a visiting Professor of Medical Education Technology, Innovation and Change for the Leeds Institute of Medical Education (LIME) of the University of Leeds, UK. He received Prizes for the Best Track Record in funded research projects (AUTH Research Committee 2009; AUTH Dean of Health Sciences 2016, AUTH excellence committee 2021) and the Best overall high/extra-ordinary academic performance (AUTH Dean of Health Sciences 2018, 2019, 2020, 2021). Since 2020, he leads the Medical Education Innovation & Research Unit (MEIRU) of the Special Unit for Biomedical Research and Education (SUBRE) of the School of Medicine. He has founded a Living Lab and 2 spin-offs.

14:00 - 14:45

Keynote Speech 4

Blockchain for IoT: Applications and Challenges
Session Chair: Efthimios Alepis

Distinguished Keynote speaker: Prof. Nidal Nasser, College of Engineering at Alfaisal University, Saudi Arabia.

The Internet of Things (IoT) is a network of physical devices and other objects, embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data. It is expected that 25 billion objects will be connected to the Internet by 2025 through different IoT-based solutions which will generate a huge amount of data, around 4.4 trillion gigabytes by the year 2025. The IoT-connected objects will be interacting with their delayed environments to sense, collect and forward the measured data. It is very important to make sure that IoT solutions are deployed in trusted distributed environments to provide features such as seamless authentication, data privacy, security, robustness against attacks, easy deployment, and self-maintenance. Blockchain is an emerging technology that will help to provide confidence in implementing the aforementioned characteristics for any IoT-based solution. In this talk, I will address the evolution of IoT in different fields followed by real examples that present the growth of data. Then present the connection between IoT & Blockchain and the necessary components to develop an efficient framework. Challenges and future directions will be presented and discussed.

Bio

Dr. Nidal Nasser, SMIEEE, received his B.Sc. and M.Sc. degrees with Honors in Computer Engineering from Kuwait University, State of Kuwait, in 1996 and 1999, respectively. He completed his Ph.D. in the School of Computing at Queen's University, Kingston, Ontario, Canada, in 2004. He is currently a Professor of Software Engineering in the College of Engineering at Alfaisal University, Saudi Arabia. He was the Acting Dean for College of Engineering-Alfaisal University, 2014-2017. He worked in the School of Computer Science at University of Guelph, Guelph, Ontario, Canada (2004-2011). Dr. Nasser was the founder and Director of the Wireless Networking and Mobile Computing Research Lab @ Guelph. He is currently the founder and Director of the Internet of Things Research Lab @ Alfaisal University. He has authored 180 journal publications, refereed conference publications and book chapters in the area of wireless communication networks and systems (Google Scholar profile: http://scholar.google.com/citations?hl=en&user=6mZsWFQAAAAJ). He has also given keynote speeches and tutorials in major international conferences. Dr. Nasser is currently serving as an associate editor of IEEE Wireless Communications Magazine, Wiley's International Journal on Communication Systems, and IEEE CommSoft E-letter. He has been a member of the technical program and organizing committees of several international IEEE conferences and workshops. Dr. Nasser is a member of several IEEE technical committees. He received Fund for Scholarly and Professional Development Award in 2004 from Queen's University. He received the Computing Faculty Appreciation Award from the University of Guelph-Humber. He received the Best Research Paper Award at the ACS/IEEE International Conference on Computer Systems and Applications (AICCSA'08), at the International Wireless Communications and Mobile Computing Conference (IWCMC'09), at the International Wireless Communications and Mobile Computing Conference (IWCMC'11), at the International Conference on Computing, Management and Telecommunications (ComManTel'13), and at the IEEE International Conference on Communications (ICC'14). He is the recipient of the Faculty Award for Research Excellence at Alfaisal University in 2014 and 2018. In 2017 he received two awards from IBM: (1) IBM Mobile Application Developer Explorer Award, and (2) IBM Big Data Developer Mastery Award. He received the IBM Data Scientist - Instructor Award for Educators in 2018. He also received the IBM Blockchain Developer Mastery Award in 2019.

Daily Program Chair: George A. Tsihrintzis

11:00 - 11:45

Keynote Speech 5

Internet of Things: Economics, Applications, and User Experience
Session Chair: George Tsichrintzis

Distinguished Keynote speaker: Prof. Anastasios Economides, Economic Department, Iniversity of Macedonia, Greece.

Internet of Things (IoT) is the worldwide Information and Communication Technologies (ICT) infrastructure that will support ubiquitous services among interacting beings, real and digital objects. It is estimated that the IoT industry will have an economic impact of several trillion dollars during the next years. Various services and applications that will use the communicated information will support users and organisations. In addition to the technology innovations, the users' needs during the whole lifetime of IoT systems should be taken into account. User experience (UX) includes the user's attitudes, perceptions, emotions, behaviour and interactions when using a product, system or service. This keynote speech presents an overview of IoT economics, applications as well as user experience issues.

Bio

Anastasios A. Economides is Full Professor at the University of Macedonia (UoM, http://www.uom.gr), Thessaloniki, Greece. He is the Director of SMILE (Smart & Mobile Interactive Learning Environments, https://smile.uom.gr) lab and CONTA (COmputer Networks and Telematics Applications, http://conta.uom.gr) group at UoM. He holds a M.Sc. and a Ph.D. degree in Computer Engineering, University of Southern California, Los Angeles (https://viterbischool.usc.edu/).

His research interests include user experience and acceptance of smart systems and services, digital skills, online and mobile teaching & learning, personalised & collaborative learning, Internet & social media marketing, e-tourism & e-culture. He has published more than three hundred peer-reviewed papers. He has received over 7000 citations, h-index = 45, i10-index = 133: https://scholar.google.com/citations?user=1AAOD6YAAAAJ&hl=en.

He teaches courses (postgraduate, undergraduate and continuing education) on E-Commerce, Information Systems Applications in Economy & Business, Digital Entrepreneurship, Educational Technology, Networking Technologies, etc. He has been Visiting Professor at various prestigious Universities, Keynote Speaker at several international conferences, principal and/or scientific investigator in many projects and participated in dozens of projects.

11:45 - 12:30

Keynote Speech 6

Visible Light Positioning in Underwater Scenarios
Session Chair: Petros Nicopolitidis

Distinguished Keynote speaker: Prof. Anna Maria Vegni, Department of Industrial, Electronic, and Mechanical Engineering at Roma Tre University, Italy.

The use of Optical Wireless Communications (OWC) is largely adopted in both indoor (i.e., smart office, smart home, industry 4.0) and outdoor applications (i.e., vehicular networks, smart cities). It is also extending to underwater scenarios, as an alternative technology to the acoustic one, which is traditionally adopted. Knowing more precisely the position of artifacts, technical/scientific instruments and operators in the marine environment increases the operational potential and consequently, the interest in the progress of knowledge is guaranteed. Furthermore, the possibility of operating in both shallow and deep waters and the opportunity to be a new underwater navigation system –main and/or auxiliary– increases the possibility of success of underwater activities, in the context of the Internet of Underwater Things (IoUT).

In such scenario, data collected by underwater sensors is interpreted w.r.t the sensor position, e.g. by tracking the movement of a target object such as Autonomous Underwater Vehicles (AUV) or Remotely Operated Vehicle (ROV). Recent advances in underwater sensors that collect and transmit high-quality, real-time data are utilized for a wide range of applications such as marine ecology, pollution and water-based disaster preventions, seabed monitoring for scientific exploration to commercial exploitation.

This talk presents recent advances of UVLP systems, able to estimate the receiver position, assuming an unknown path. We also discuss about attenuation losses due to water turbidity, which may cause an affection of localization error accuracy, and then results in increasing values. The proposed UVLP system could also be seen as an innovative “Turbidimeter”, intended as a water transparency monitoring system and/or water turbidity meter. To exploit this additional function, the UVLP system does not require any preliminary and additionally time-consuming calibrations in the field, unlike the measuring instrumentation currently on the market

Bio

Anna Maria Vegni [IEEE Senior Member] (annamaria.vegni@uniroma3.it) has been a tenure-track assistant professor in the Department of Industrial, Electronic, and Mechanical Engineering at Roma Tre University (Italy), since 2020. She received the Ph.D. degree in biomedical engineering, electromagnetics and telecommunications from the Department of Applied Electronics, Roma Tre University, in 2010. She received the M.Sc. degree cum laude in electronics engineering from Roma Tre University in 2006. In 2009, she was a visiting researcher in the Multimedia Communication Laboratory, directed by Prof. Little, in the Department of Electrical and Computer Engineering, Boston University, Boston, MA, working on vehicular networking supported by heterogeneous wireless networks. In 2021, she received the Italian Habilitation (Abilitazione Scientifica Nazionale) for a Full Professorship in telecommunication engineering. She has been involved in several European projects (H2020 Shift2Rail Alternative Bearers for Railway, COST Action CA19111 NEWFOCUS, FP7 ISITEP). She is involved in the organization of several IEEE and ACM international conferences and is a member of the editorial board of IEEE ComMag, JCN, Ad Hoc Networks, JNCA Elsevier journals, and ETT Wiley journal.

12:30 - 12:45

Break

12:45 - 13:30

Keynote Speech 7

Continuously Streaming Artificial Intelligence
Session Chair: Maria Virvou

Distinguished Keynote speaker: Prof. Adrian Bors, Department of Computer Science, University of York, United Kingdom.

The talk will start with introducing the concept of Lifelong artificial learning also called continual learning and how this differs from the classical concepts in machine learning. Lifelong learning, also known as continual learning, aims to learn a succession of databases while knowing at each time all the previously learned data. Such an approach is different from the classical machine learning, where a database is formed, and a system is trained using the data and then applied for the applications it was trained. In classical systems, when the data is changed the system would have to be retrained with the new data, while completely forgetting the data learnt before and which may no longer be available. The objectives and challenges of this new type of learning will be discussed in the context of applications involving image classification and generation. Various approaches including mixed deep learning architectures will be presented and discussed. Architectures involving expanding mixtures of deep learning modules as well as using knowledge distillation in teacher-student learning will be discussed. The criteria for keeping the trade-off between the computational resources and the data to be learnt are also important. Further challenges and perspectives will end the talk.

Bio

Adrian G. Bors is an Associate Professor in the Department of Computer Science, Univ. of York, U.K. He received Ph.D. degree in informatics from the University of Thessaloniki, Thessaloniki, Greece, in 1999 and the M.Sc. degree in electronics engineering from the Polytechnic University of Bucharest, Bucharest, Romania, in 1992. Dr. Bors held also previously academic positions at Tampere Univ. of Technology, Finland, and was a Visiting Scholar at the Univ. of California at San Diego (UCSD), and an Invited Professor at the Univ. of Montpellier, France.

Dr. Bors has been a member of the organizing committees for IEEE WIFS 2021, IPTA 2020, IEEE ICIP 2018, BMVC 2016, IPTA 2014, CAIP 2013, and IEEE ICIP 2001. He was an Associate Editor of the IEEE Trans. on Imagr Processing from 2010 to 2014 and the IEEE Trans. on Neural Networks from 2001 to 2009. He was a Co-Guest Editor for a special issue on Machine Vision for the International Journal for Computer Vision in 2018 and the Journal of Pattern Recognition in 2015. Dr. Bors has authored and co-authored more than 150 research papers including 33 in journals. His research interests have lately included continual and lilfelong artificial learning, video processing and generation using machine learning, influencing image memorability, and image retrieval.

13:30 - 15:00

Information Technology 1

Session Chair: George A. Tsihrintzis

A Comprehensive Study on Artificial Intelligence and Blockchain Driven Beyond 5G Networks
Nitin Gupta; Mohammad S. Obaidat; Deborsi Basu; Uttam Ghosh; Kuei-Fang Hsiao

Tracking container network connections in a Digital Data Marketplace with P4
Sara Shakeri; Lourens Veen; Paola Grosso

Clustering-based Optimal Resource Allocation Strategy in Title Insurance Underwriting
Abhijit Guha; Mohammad S. Obaidat; Debabrata Samanta; SK Hafizul Islam

15:00 - 15:15

Break

15:15 - 16:45

Information Technology 2

Session Chair: Maria Virvou

Metaverse assisted Telesurgery in Healthcare 5.0: An interplay of Blockchain and Explainable AI
Pronaya Bhattacharya; Mohammad S. Obaidat; Darshan Savaliya; Sakshi Sanghavi; Sudeep Tanwar; Balqies Sadoun

A Deep Learning Based Sound Event Location and Detection Algorithm Using Convolutional Recurrent Neural Network
Hongxiang Zhu; Jun Yan

SaFaR: Solana Blockchain-based Optimal Route Selection Scheme for Cab Aggregators
Pronaya Bhattacharya; Ashwin Verma; Mohammad S. Obaidat; Sudeep Tanwar; Balqies Sadoun

16:45 - 18:15

Information Technology 3

Session Chair: Evangelia-Aikaterini Tsichrintzi

Design of Blockchain-based Secure Electric Vehicle Charging System Using ECC
Dwivedi Sanjeev Kumar; Ruhul Amin; Satyanarayana Vollala

A CNN based localization and activity recognition algorithm using multi-receiver CSI measurements and decision fusion
Wei Sun; Jun Yan

Evaluating the Optimal Number of Clusters to Identify Similar Gene Expression Patterns During Erythropoiesis
Heba Saadeh; Maha Saadeh; Wesam Almobaideen; Marwan Al-Tawil

Suitable Professional Identity Analysis to Improve Information Security Governance
Segundo Moisés MT Toapanta Toapanta; Rodrigo Humberto del Pozo Durango; Luis Enrique Mafla Gallegos; María Mercedes Baño Hifong; Rocio Maciel; José Antonio Orizaga Trejo

Friday, July 15

Daily Program Chair: George A. Tsihrintzis

11:00 - 12:30

Computer Systems

Session Chair: Helen Karatza

SCAL-E: An Auto Scaling Agent for Optimum Big Data Load Balancing in Kubernetes Environments
Efstratios Karypiadis; Anastasios Nikolakopoulos; Achilleas Marinakis; Vrettos Moulos; Theodora A. Varvarigou

On Efficiently Partitioning a Topic in Apache Kafka
Theofanis P. Raptis; Andrea Passarella

A Deep Learning Based Bluetooth Indoor Localization Algorithm by RSSI and AOA Feature Fusion
Dekang Zhu; Jun Yan

Security-Aware Orchestration of Linear Workflows on Distributed Resources
Georgios L. Stavrinides; Helen Karatza

12:30 - 14:00

Networking

Session Chair: Petros Nicopolitidis

Insight of Anomaly Detection with NWDAF in 5G
Yachao Yuan; Christian Gehrmann; Jakob Sternby; Luis Barriga

Energy Harvesting WSNs with Adaptive Modulation: Inter-delivery-aware Scheduling Algorithms
Chaima Zouine; Amina Hentati; Jean-François Frigon

Learning-Automata-Based Energy Efficient Model for Device Lifetime Enhancement in LoRaWAN Networks
Konstantina Spathi; Anastasios Valkanis; Georgia Beletsioti; Konstantinos Kantelis; Petros Nicopolitidis; Georgios Papadimitriou

CNN-Based Automatic Modulation Classification in OFDM Systems
Geonho Song; Mingyu Jang; Dongweon Yoon

14:00 - 14:15

Break

14:15 - 15:45

Telecommunications

Session Chair: Maria Virvou

Deep Reinforcement Learning based Intrusion Detection System with Feature Selections Method and Optimal Hyper-parameter in IoT Environment
Said Bakhshad; Vasaki Ponnusamay; Robithoh Annur; Muhammad Waqas; Hisham Alasmary; Shanshan Tu

Indoor-Outdoor Wireless Link Propagation from tunnels and long corridors
Ori Glikstein; Sapir Hanina; Nezah Balal; Gad A. Pinhasi; Yosef Pinhasi

Ciphertext-Policy Attribute-based Encryption for Securing IoT Devices in Fog Computing
Shanshan Tu; Fengming Huang; Shengju Zhang; Akhtar Badshah; Hisham Alasmary; Muhammad Waqas

Intrusion Detection System using Aggregation of Machine Learning Algorithms
Arivarasan K; Mohammad S. Obaidat

15:45 - 16:15

Closing Session