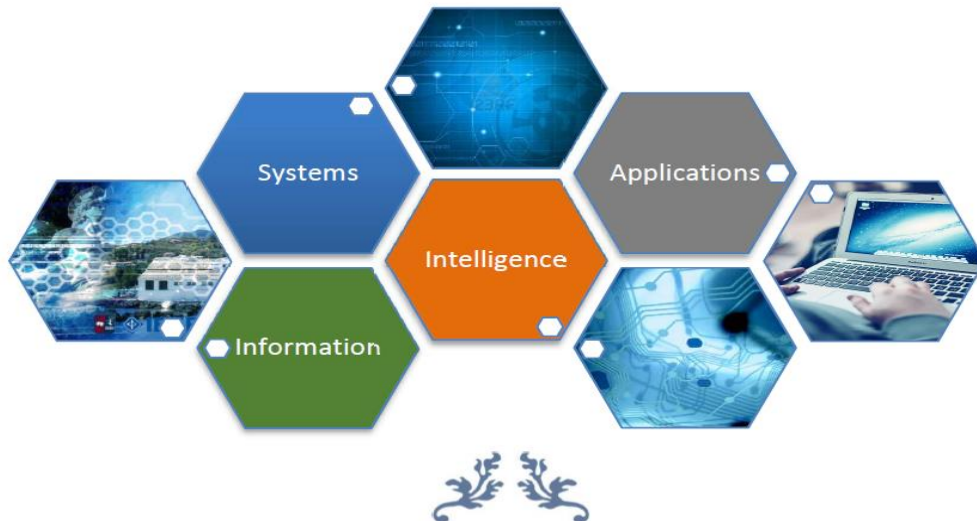




**The 10th International Conference on Information,
Intelligence, Systems and Applications
15-17 July 2019, Patras, Greece**

<http://iisa2019.upatras.gr/>



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.



University of the
Peloponnese



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IISA 2019 Chairs' Message

Welcome to the 2019 International Conference on Information, Intelligence, Systems, and Applications (IISA 2019). IISA 2019 is the tenth conference in the IISA series organized by the University of Patras and the University of the Peloponnese. 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 conference is held on an annual basis and intended as an international forum for researchers and professionals in all areas of Information, Intelligence, Systems and Applications. Every year, we invite submission of papers presenting high-quality original research and developments for the conference tracks listed below. The conference features tutorials, technical paper presentations, workshops, and distinguished keynote speeches.

This year's conference marks the tenth IISA. IISA 2019 is located in Patras, Greece. IISA 2019 will last for three days and its technical program consists of twenty one (21) technical paper presentation sessions, a poster session, a tutorial session and 3 keynote plenary speeches. Also, this year we have two satellite events, a Project Track (including 3 sessions) and an Industrial Track (including one session). We received one hundred and forty (140) high quality submissions. From them sixty three (63) were accepted as full papers, which gives an acceptance of 45% for full papers. Also, thirty one (31) accepted as short papers, which gives an acceptance of 22% for short papers. Moreover, accepted papers were authored by authors-researchers from several countries who represented academia, government, industry, and business.

In addition to the technical paper presentations, IISA 2019 features a planetary Tutorial on Machine Learning and the Positive Unlabeled Learning Problem organized by Kristen Jaskie and Andreas Spanias, a Project Track where 20 European and National R&D projects will be presented as well as an Industrial Track where 4 companies will participate presenting their products, services and activities.

We are thankful to the many people who contributed to the success of IISA 2019. Firstly, thanks are due to the paper authors, including those whose papers were not accepted in the program, for choosing IISA 2019 as the forum for disseminating the results of their research. We are also thankful to the IISA2019 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 IISA2019. Thanks are also due to the University of Patras, the University of the Peloponnese and the University of Piraeus for their technical co-sponsorship of the conference. Many thanks are due to the Local Organizing Chairs:

Constantinos Koutsojannis, University of Patras

Michael Paraskevas, University of the Peloponnese

Foteini Grivokostopoulou, University of Patras

Isidoros Perikos, University of Patras

for their actions to organize the conference. Last, but not least, special thanks are due to the IISA 2019 coordinator, Easy Conferences Ltd., Cyprus. Finally, on behalf of the 2019 International Conference on Information, Intelligence, Systems, and Applications (IISA 2019), we invite all of you to join us in Patras, Greece and enjoy the program and your stay in this beautiful place.

IISA 2019 PC Chairs

Ioannis Hatzilygeroudis, University of Patras, Chair

Michael Paraskevas, University of the Peloponnese, Co-Chair

IISA 2019 General Chairs

Prof.-Dr. Nikolaos Bourbakis, Wright State University, USA

Prof.-Dr. George A. Tsihrintzis, University of Piraeus, Greece

Prof.-Dr. Maria Virvou, University of Piraeus, Greece

Conference Committees

IISA Steering Committee



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Program Chairs



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Conference Local Organizing Chairs

- Konstantinos Koutsojannis, University of Patras
- Michael Paraskevas, University of the Peloponnese & Computer Technology Institute and Press
- Foteini Grivokostopoulou, University of Patras
- Isidoros Perikos, University of Patras

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- Boutsinas Basilis, University of Patras, Greece
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- Dentsoras, Argyris, University of Patras, Greece
- Dounias Georgios, University of the Aegean, Greece
- Esposito Anna, BAMbini_721, Italy
- Fournaris, Apostolos ISI / R.C. ATHENA Greece
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- Galiotou, Eleni, University of West Attica, Greece
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- Kotzanikolaou Panayiotis, University of Piraeus, Greece
- Koutsojannis Constantinos, University of Patras, Greece
- Koutsomitropoulos Dimitrios, University of Patras, Greece
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- Likothanassis Spiros, University of Patras, Greece
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- Louta Malamati, University of Western Macedonia, Greece
- Luna jose maria, University of Cordoba, Spain
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- Makris Christos, University of Patras, Greece
- Mani Ashish, Amity, India
- Mavroudi Seferina , TEI of Western Greece, Greece
- Moreno Antonio, Univ. Rovira i Virgili, Spain
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- Palkova Zuzana , Slovak University of Agriculture, Slovakia
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- Papageorgiou Elpiniki, University of Thessaly, Greece
- Paraskevas Michael, University of the Peloponnese, Greece
- Patsakis Constantinos, University of Piraeus, Greece
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- Sgarbas Kyriakos, University of Patras, Greece
- Sioutas Spyros, University of Patras, Greece
- Sirmakessis Spiros, University of the Peloponnese,, Greece
- Solanas Agusti, Universitat Rovira i Virgili, Spain
- Sotiropoulos Dionisios, University of Piraeus, Greece
- Stafylopatis Andreas, National Technical University of Athens, Greece
- Stamatatos Efstathios, University of the Aegean, Greece
- Stefaneas Petros, NTUA, Greece
- Styliaras Georgios, University of Patras, Greece
- Symvonis Antonios, National Technical University of Athens, Greece

- Tsihrintzis George, University of Piraeus, Greece
- Tsolis Dimitrios, University of Patras, Greece
- Tzimas Giannis, University of the Peloponnese, Greece
- Valchinov Emil, University of Patras, Greece
- Verykios Vassilios, Hellenic Open University, Greece
- Virvou Maria, University of Piraeus, Greece
- Voros Nikolaos University of the Peloponnese, Greece
- Vouros George, University of Piraeus, Greece
- Vrahatis Michael, University of Patras, Greece
- Washizaki Hironori, Waseda University, Japan
- Xenos Michalis, University of Patras, Greece
- Yamaguchi Takahira, Keio Univ, Japan
- Yamamoto Shuichiro, Nagoya University, Japan
- Zarouchas Thomas, Computer Technology Institute and Press "Diophantus", Greece

Invited Keynote Speakers

Grigoris Antoniou



Title: Semantics and Reasoning in the Big Data Era

Abstract:

Data originating from the Web, sensor networks and social media result in increasingly huge datasets. The so-called Big Data creates new opportunities for advanced applications in domains ranging from smart cities to intelligent healthcare, hence the increasing interest in academia and industry. Usually Big Data is associated with machine learning / data mining. This talk will argue that semantic and knowledge technologies have an important role to play. Traditionally, reasoning approaches have mostly focused on complex knowledge structures/programs and centralized in-memory data, so the question arises whether and how they can be adapted to scale sufficiently to meet the Big Data challenges. This talk will review seminal work on large-scale massively parallel RDFS reasoning, before turning its attention to more recent works addressing more complex reasoning tasks. The talk will conclude with a number of open research challenges in the area, and possible applications in the legal domain in the context of the EU-funded MIREL project.

Bio:

Grigoris Antoniou is Professor of Computer Science at the University of Huddersfield, UK. Previously he has held professorial appointments at the University of Crete (where he was also Head of the Information Systems Laboratory at FORTH-ICS, the top-rated research institute in Greece), Griffith University, Australia, and the University of Bremen, Germany. His research interests lie in semantic technologies, particularly knowledge representation and reasoning and semantics for big data, and its application to ambient intelligence, e-health, and transportation. He has published over 200 technical papers in scientific journals and conferences. He is author of three books with international publishers (MIT Press, Addison-Wesley); his book “A Semantic Web Primer” is internationally the standard textbook in the area, and has been or is about to be translated to Japanese, Chinese, Korean, Spanish and Greek. His research has attracted around 10.000 citations. In recognition of his work, he was elected an EurAI Fellow in 2006, joining the prestigious list of the best AI researchers in Europe. He is member of three editorial boards of journals, has organised a number of conferences and workshops (including leadership positions at ESWC 2010 and 2011), and has served in numerous programme committees. He has led a number of national and international research projects, and has participated in many more.

<https://pure.hud.ac.uk/en/persons/grigoris-antoniou>

Jean-Baptiste Mouret



Title: Designing robots that can learn: why, when, and how?

Abstract:

The recent advances in deep learning are generating an impressive interest in machine learning, but their influence on robotics is not as strong as we could think (yet). In this talk, I will show in which situations robots can benefit from learning and what constraint robots impose on learning algorithms. Focusing on trial-and-error learning, I will then introduce the work of our team to address these challenges, in particular to allow legged robots to recover from mechanical damage in a few minutes.

Bio:

Dr. Jean-Baptiste Mouret is a senior researcher ("Directeur de recherche") at Inria, the French research institute dedicated to computer science and mathematics, and he is currently the principal investigator of an ERC grant (ResiBots – Robots with animal-like resilience, 2015-2020). Overall, J.-B. Mouret conducts researches that intertwine machine learning, robotics, and evolutionary computation to make robots that can adapt as quickly and as creatively as possible. His work was recently featured on the cover of Nature ("Robots that adapt like animals", Cully et al., 2015) and it received several national and international scientific awards, including the "Prix La Recherche 2016", the "Distinguished Young Investigator in Artificial Life 2017", and several best paper awards in major conferences of his field. Before joining Inria, he was an assistant professor ("maitre de conferences") at the Pierre and Marie Curie University (now Sorbonne Universite) in Paris, France (2009-2015).

<https://members.loria.fr/JBMouret/>

Eleni Stroulia



Title: Research Challenges around Smart Indoor Spaces

Abstract:

The advancement of Internet of Things (IoT) technologies is promising to revolutionize many aspects of our life, and key among them is the spaces where we live, study, and work. Sensors embedded in our homes and buildings enable the systematic analysis and quantification of our activities in these spaces, and, in turn, afford us the opportunity to make informed decisions on (a) how to optimize the safety and comfort of the buildings' occupants and (b) how to reduce the energy consumed by these buildings and their impact to the environment. In this presentation, I will review the key challenges in this area and I will present some of our recent solutions.

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, adopting AI and machine-learning methods to improve or automate tasks. Her flagship project in the area of health care is the Smart Condo in which she investigates the use of technology to support people with chronic conditions live independently longer and to educate health-science students to provide better care for these clients. In 2011, the Smart-Condo team received the UofA Teaching Unit Award. She has played leadership roles in the GRAND and AGE-WELL NCEs, the SAVI Strategic Network and the DITA CREATE network and in 2018 she received a McCalla professorship for her innovative integration of research and teaching.

<https://www.ualberta.ca/science/about-us/contact-us/faculty-directory/elena-stroulia>

Program at a Glance

Monday, 15 July

Registration/Support Desk hours (08.00-13.00 & 14.30-16.00)			
09.00 – 09.30	Opening Session (Amphitheater)		
09.30 – 10.30	Keynote Speech-1 (Amphitheater)		
10.30 – 11.00	COFFEE BREAK		
	Amphitheater	Room A	Room B
11.00 – 13.00	MM-1	MM-2	MM-3
13.00 – 14.30	LUNCH		
14.30 – 16.30	MA-1	MA-2	MA-3
16.30 – 17.00	COFFEE BREAK		
17.00 – 18.00	POSTERS		
18.00 – 19.00	WELCOME RECEPTION		

Tuesday, 16 July

Registration/Support Desk hours (08.00-13.00 & 14.30-16.00)			
09.00 – 10.00	Keynote Speech-2 (Amphitheater)		
10.00 – 10.30	COFFEE BREAK		
	Amphitheater	Room A	Room B
10.30 – 12.00	TM-1	TM-2	TM-3
12.00 – 13.30	TUT	IT	PT-1
13.30 – 14.30	LUNCH		
14.30 – 16.00	TA-1	TA-2	PT-2
16.00 – 16.30	COFFEE BREAK		
16.30 – 18.00	TA-3	TA-4	PT-3
20.00 – 23.00	CONFERENCE DINNER		

Wednesday, 17 July

Registration/Support Desk hours (08.00-13.00 & 14.30-16.00)			
09.00 – 10.00	Keynote Speech-3 (Amphitheater)		
10.00 – 10.30	COFFEE BREAK		
	Amphitheater	Room A	Room B
10.30 – 12.00	WM-1	WM-2	WM-3
12.00 – 13.30	WM-4	WM-5	PT-4
13.30 – 14.30	LUNCH		
14.30 – 16.30	WA-1	WA-2	WA-3
16.00 – 16.30	CLOSING SESSION		

Detailed Program

Monday, 15 July

Registration/Support Desk hours (08.00-13.00 & 14.30-16.00)			
09.00 – 09.30	Opening Session (Amphitheater) Professor George A. Tsihrintzis , University of Piraeus, Greece Professor Maria Virvou , University of Piraeus, Greece Professor Ioannis Hatzilygeroudis , University of Patras, Greece		
09.30 – 10.30	Keynote Speech-1 (Amphitheater) Professor Grigoris Antoniou , University of Huddersfield, UK Title: Semantics and Reasoning in the Big Data Era		
10.30 – 11.00	COFFEE BREAK		
	Amphitheater	Room A	Room B
11.00 – 13.00	MM-1 E-Learning and Virtual Reality Session Chair: M. Rigou	MM-2 Deep Learning and Applications Session Chair: S. Kotsiantis	MM-3 Sentiment Analysis and Text mining Session Chair: I. Perikos
11.00 – 11.25	ICT in education: Benefits, Challenges and New directions <i>Sotiria Foutsitzi, George Caridakis</i>	Dynamic Pruning of CNN networks <i>Nikolaos Fragoulis, Ilias Theodorakopoulos, Vasileios Pothos, Evangelos Vassalos</i>	Leveraging Social Media Linguistic Features for Bilingual Microblog Sentiment Classification <i>Konstantinos Tsamis, Andreas Komninos, John Garofalakis</i>
11.25 – 11.50	Enter the Serious E-scape Room: A Cost-Effective Serious Game Model for Deep and Meaningful E-learning <i>Stylianos Mystakidis, Enrique Cachafeiro, Ioannis Hatzilygeroudis</i>	On the Use of Deeper CNNs in Hand Gesture Recognition Based on sEMG Signals <i>Nikolaos Tsagkas, Panagiotis Tsinganos, Athanassios Skodras</i>	PaloAnalytics: project concept, scope and early results from the system implementation <i>Vassilis Pouloupoulos, Manolis Wallace, Iraklis Varlamis, George Caridakis, Panagiotis Tsantilas</i>
11.50 – 12.15	What Does the Pedagogical Agent Say? <i>Athanasios Christopoulos, Marc Conrad, Mitul Shukla</i>	Financial Fraudulent Statements Detection through a Deep Dense Artificial Neural Network <i>Georgios Temponeras, Stamatios-Aggelos Alexandropoulos, Sotiris Kotsiantis, Michael Vrahatis</i>	Improving Sentiment Analysis for the Greek Language using Discretization Technique <i>Nikolaos Spatiotis, Isidoros Perikos, Michael Paraskevas, Iosif Mporas</i>
12.15 – 12.40	Smart educational games and Consent	Deep Learning-based Vehicle Orientation	A Methodology for Generated Text

	<p>under the scope of General Data Protection Regulation <i>Spyros Papadimitriou, Eirini Mouggiakou, Maria Virvou</i></p>	<p>Estimation and LiDAR-View Analysis for ADAS applications <i>Jongkuk Park, Yookhyun Yoon</i></p>	<p>Annotation for High Quality Speech Synthesis <i>Dimitris Spiliotopoulos, Costas Vassilakis, Dionisis Margaritis, Kostantinos Kotis</i></p>
12.40 – 13.05	<p>An overview of Affective Models and ICT in Education <i>Sotiria Foutsitzi, Stylianos Asteriadis, George Caridakis</i></p>	<p>Using Neural Networks for RSSI Location Estimation in LoRA Networks <i>Ioannis Daramouskas, Vaggelis Kapoulas, Michael Paraskevas</i></p>	<p>A NoSQL Approach for Aspect Mining of Cultural Heritage Streaming Data <i>Gerasimos Vonitsanos, Andreas Kanavos, Alaa Mohasseb, Dimitrios Tsolis</i></p>
13.00 – 14.30	LUNCH		
14.30 – 16.30	Amphitheater	Room A	Room B
	<p>MA-1 E-Learning Systems Session Chair: M. Virvou</p>	<p>MA-2 Optimization Techniques Session Chair: D. Sotiropoulos</p>	<p>MA-3 Reinforcement and Deep Learning Session Chair: K. Blekas</p>
14.30 – 14.55	<p>Comparative study of two different MOOC forums post classifiers: analysis and generalizability issues <i>Anastasios Ntourmas, Nikolaos Avouris, Sophia Daskalaki, Yannis Dimitriadis</i></p>	<p>A quantum-inspired optimization heuristic for the multiple sequence alignment problem in bio-computing <i>Konstantinos Giannakis, Christos Papalitsas, Georgia Theocharopoulou, Sofia Fanarioti, Theodore Andronikos</i></p>	<p>Navigation of inertial forces driven mini-robots using reinforcement learning <i>Piyabhum Chaysri, Konstantinos Blekas, Kostas Vlachos</i></p>
14.55 – 15.20	<p>Implementing a MOOC course for Museum Professionals with a worldwide effect <i>Panagiota Polymeropoulou, Christos Pierrakeas, Spiros Borotis, Achilles Kameas</i></p>	<p>Performance Evaluation and Comparison of Multi-objective Optimization Algorithms <i>Dimitrios Tsarmpopoulos, Athanasia Papanikolaou, Sotiris Kotsiantis, Theodoula Grapsa, George Androulakis</i></p>	<p>Collaborative multiagent reinforcement learning schemes for air traffic management <i>Christos Spatharis, Konstantinos Blekas, Alevizos Bastas, Theocharis Kravaris, George Vouros</i></p>
15.20 – 15.45	<p>Injecting intelligence into learning management systems: The case of adaptive</p>	<p>Optimal Duopolistic Competition Strategies in Social Networks</p>	<p>A Weighted Late Fusion Framework for Recognizing Human Activity from</p>

	grain-size instruction <i>Christos Troussas, Akrivi Krouska, Maria Virvou</i>	<i>Dionisios Sotiropoulos, Ifigeneia Georgoula, Christos Bilanakos</i>	Wearable Sensors <i>Athina Tsanousa, Georgios Meditskos, Stefanos Vrochidis, Ioannis Kompatsiaris</i>
15.45 – 16.10	Adding Social Comparison to Open Learner Modeling <i>Angeliki Leonardou, Maria Rigou</i>	Hyperparameter Optimization of LSTM Network Models through Genetic Algorithm <i>Nikolaos Gorgolis, Ioannis Hatzilygeroudis, Zoltan Istenes, Lazlo – Grad Gyenne</i>	Cognitive Infotainment Systems for Intelligent Vehicles <i>Ilias Panagiotopoulos, George Dimitrakopoulos</i>
16.10 – 16.35	Advancing Adult Online Education through a SN-Learning Environment <i>Akrivi Krouska, Christos Troussas, Maria Virvou</i>	Timetable Scheduling Using a Hybrid Particle Swarm Optimization with Local Search Approach <i>Evgenia Psarra, Dimitris Apostolou</i>	Deep Learning for Agricultural Land Detection in Insular Areas <i>Eleni Charou, George Felekis, Danai Bournou Stavroulopoulou, Maria Koutsoukou, Antigoni Panagiotopoulou, Yorghos Voutos, Emmanuel Bratsolis, Phivos Mylonas, Laurence Likforman-Sulem</i>
16.30 – 17.00	COFFEE BREAK		
17.00 – 18.00	POSTERS		
	RNNs for Classification of Driving Behaviour <i>Dimitris Mantzekis, Michalis Savelonas, Stavros Karkanis, Evaggelos Spyrou</i>		
	Legal issues within ambient intelligence environments <i>Lambrini Seremeti, Ioannis Kougias</i>		
	A-Farm Precision Farming CPS Platform <i>Konstantinos Antonopoulos, Christos Panagiotou, Christos Antonopoulos, Nikolaos Voros</i>		
	Learning outcomes design for Data Science and Internet of Things training programs <i>Vasileios Gkamas, Maria Rigou, Ivaylo Gueorguiev, Pavel Varbanov, Christina Todorova</i>		
	Cutting Edge Collaborative eLearning Services: The Case of the Greek School Network <i>Kostantinos Kyritsis, Eleni Stergatou</i>		
Sentinel-2 “low resolution band” optimization using Super-Resolution techniques: Lysimachia Lake pilot area of analysis <i>Antigoni Panagiotopoulou, Eleni Charou, Marianthi Stefouli, Konstantinos Platis, Nicholas Madamopoulos, Emmanuel Bratsolis</i>			

	Modelling prediction of enterprises payment behavior for applying machine learning methods <i>Angeliki Maria Christidi, Constantinos Christidis, Tilemahos Manolatos, Ioannis Hatzilygeroudis, Eleni Voyiatzaki</i>
	Monitoring Application for Farmer Pesticide Use <i>Jaime Caro, Michael Tee, Edna Aguilar, Jose Mari Catipay</i>
	Emerging multi-functional, personalized secure environments Ioannis Pikrammenos, Christos Lampiris, Panagiotis Perakis <i>WELCOME</i>
18.00 – 19.00	<i>RECEPTION</i>

Tuesday, 16 July

Registration/Support Desk hours (08.00-13.00 & 14.30-16.00)			
09.00 – 10.00	Keynote Speech-2 (Amphitheater) Professor Eleni Stroulia , University of Alberta, Canada Title: Research Challenges around Smart Indoor Spaces		
10.00 – 10.30	<i>COFFEE BREAK</i>		
10.30 – 12.00	Amphitheater	Room A	Room B
	TM-1 E-Learning Methods and Systems Session Chair: S. Mystakidis	TM-2 Image Processing and Recognition Session Chair: K. Jaskie	TM-3 Computer Networks Session Chair: G. Tzimas
10.30 – 10.50	Transformable Lighting Conditions in Learning VR Environments <i>Anna-Maria Velentza, Antonios Nikitakis, Konstantinos Alketas-Oungrinis, Elias Economou</i>	License Plate Extraction for Moving Vehicles <i>Yongsung Cheon, Chulhee Lee</i>	Multiple Path Load Balancing for TCP Large Scale Networks <i>Konstantinos Paximadis, Giannis Tzimas, Anna Galanopoulou, Pavlos Kalpakioris</i>
10.50 – 11.10	A Tangible Programming Language for the Educational Robot Thymio <i>Andrea Mussati, Christian Giang, Alberto Piatti, Francesco Mondada</i>	Could DCT Reveal Photorealistic Images? <i>Konstantinos Annousakis-Giannakopoulos, Dimitris Ampeliotis, Athanassios Skodras</i>	Random Walkers Coverage Experimentation and Evaluation in Low-Cost Wireless Home Networks <i>Aikaterini Georgia Alvanou, Konstantinos Skiadopoulos, Konstantinos Giannakis, Georgios Tsoumanis, Konstantinos Oikonomou</i>
11.10 – 11.30	Using Learning Analytics to improve the efficacy of Mobile Authoring Tools	Formation-aware cloud segmentation of ground-based images with Applications to	An Experimental Analysis of Current DDoS attacks Based on a Provider Edge

	<i>Akrivi Krouska, Christos Troussas, Maria Virvou</i>	PV Systems <i>Juan Andrade, Sameeksha Katoch, Pavan Turaga, Andreas Spanias, Cihan Tepedelenlioglu, Kristen Jaskie</i>	Router HoneyNet <i>Stamatia Triantopoulou, Dimitrios Papanikas, Panayiotis Kotzanikolaou</i>
11.30 – 11.50	WARP : A Workflow-Aware Instructional Platform for Competency-Based Learning <i>Geoffrey Solano, Jose Louie Mark Ano, John Arthur Hernan, Ronalyn Grace Francisco</i>	Lip Reading in Greek words at unconstrained driving scenario <i>Dimitris Kastaniotis, Dimitrios Tsourounis, Aristotelis Koureleas, Bojidar Peev, Christos Theoharatos, Spiros Fotopoulos</i>	Intra-Train Connectivity Analysis to Enable Context Aware Passenger Environments <i>Peio Lopez-Iturri, Erik Aguirre, Edgar Batista, Mikel Celaya, Leyre Azpilicueta, Agusti Solanas, Francisco Falcone</i>
11.50 – 12.10	Upgrading the Mobile Distance Learning System Architecture <i>Oxana Kalita, Denisenko Vladimir, Georgios Pavlidis</i>	Bitrate and Transmission Resolution Determination Based on Perceptual Video Quality <i>Chulhee Lee</i>	Measuring the Research Performance of UK Computer Science Departments via Network DEA <i>Gregory Koronakos, Lucie Chytilova, Dimitris Sotiros, Dimitris K. Despotis</i>
12.00 – 13.30	TUTORIAL Machine Learning and the Positive Unlabeled Learning Problem <i>Kristen Jaskie, Andreas Spanias</i>	INDUSTRIAL TRACK (Industrial Track has its own program)	PROJECT TRACK (Project Track has its own program)
13.30 – 14.30	LUNCH		
14.30 – 16.30	Amphitheater	Room A	Room B
	TA-1 Educational Informatics Session Chair: E. Alepis	TA-2 Bioinformatics, Biomedicine and Bioengineering Session Chair: G. Solano	PROJECT TRACK
14.30 – 14.55	BYOD for learning and teaching in Greek Schools: Challenges and constraints according to teachers' point of view <i>Vasileios Gkamas, Michael Paraskevas,</i>	Clique-finding Tool for Detecting Approximate Gene Clusters <i>Geoffrey Solano, Bianca Camille Silmaro</i>	

	<i>Emmanouel Varvarigos</i>		
14.55 – 15.20	Adaptive e-learning interactions using dynamic clustering of learners' characteristics <i>Christos Troussas, Akrivi Krouska, Maria Virvou</i>	A precision medicine approach for non-opioid pain therapy using a combination of multi-objective optimization and support vector regression <i>Dimitrios Jeffrey Gudin, Seferina Mavroudi, Aigli Korfiati, Konstantinos Theofilatos, Derek Dietz, Peter Hurwitz</i>	
15.20 – 15.45	Multi-objective Optimization of C4.5 Decision Tree for Predicting Student Academic Performance <i>Georgios Kostopoulos, Nikos Fazakis, Sotiris Kotsiantis, Kyriakos Sgarbas</i>	InteGene: An Integer Linear Programming Tool for Discovering Approximate Gene Clusters <i>Geoffrey Solano, Princess Danielle Florendo</i>	
15.45 – 16.10	NLP-based error analysis and dynamic motivation techniques in mobile learning <i>Christos Troussas, Akrivi Krouska, Maria Virvou</i>	Fluid-structure interaction simulation framework for cerebral aneurysm wall deformation <i>Giorgos Papoulias, Stavros Nousias, Konstantinos Moustakas</i>	
16.00 – 16.30	COFFEE BREAK		
	Amphitheater	Room A	Room B
16.30 – 18.00	TA-3 Health Informatics Session Chair: E. Sakkopoulos	TA-4 Machine Learning, Data/Text Mining Session Chair: G. Solano	PROJECT TRACK
16.30 – 16.55	Personalized assistant apps in healthcare: a Systematic Review <i>Evangelos Sakkopoulos, Mersini Paschou</i>	Positive and Unlabeled Learning Algorithms and Applications: A Survey <i>Kristen Jaskie, Andreas Spanias</i>	
16.55 – 17.20	e-PEMICU: an e-Health Platform to Support Early Mobilisation in Intensive Care Units <i>Antoni Martínez-</i>	Self-trained eXtreme Gradient Boosting Trees <i>Nikos Fazakis, Georgios Kostopoulos, Stamatis</i>	

	<i>Ballesté, Pablo Gimeno-Sarroca, Aleix Mariné, Edgar Batista, Agusti Solanas</i>	<i>Karlos, Sotiris Kotsiantis, Kyriakos Sgarbas</i>	
17.20 – 17.45	Skip Miner: Towards the Simplification of Spaghetti-like Business Process Models <i>Edgar Batista, Agusti Solanas</i>	TMG-BoBI: Generating Back-of-the-Book Indexes with the Text-to-Matrix-Generator <i>Theoni Koutropoulou, Efstratios Gallopoulos</i>	
17.45 – 18.10	Image Processing and Classification Method Appropriate for Extensible Mobile Applications <i>Nikos Petrellis</i>	A Self-Pruning Classification Model for News <i>Leonidas Akritidis, Athanasios Fevgas, Panayiotis Bozanis, Miltiadis Alamaniotis</i>	
20.00-23.00	CONFERENCE DINNER		

Wednesday, 17 July

Registration/Support Desk hours (08.00-13.00 & 14.30-16.00)			
09.00 – 10.00	Keynote Speech-3 (Amphitheater) Professor Jean-Baptiste Mouret, INRIA Nancy, France Title: Designing robots that can learn: why, when, and how?		
10.00 – 10.20	COFFEE BREAK		
	Amphitheater	Room A	Room B
10.20 – 12.00	WM-1 Machine Learning Techniques Session Chair: S. Kotsiantis	WM-2 Fuzzy Inference and Systems Session Chair: E. Papageorgiou	WM-3 Data Structures, Graphs and Nets Session Chair: A. Solanas
10.20 – 10.40	Instance Selection Techniques for Multiple Instance Classification <i>Efstathios Branikas, Thomas Papastergiou, Evangelia I. Zacharaki, Vasileios Megalooikonomou</i>	A software tool for FCM aggregation employing credibility weights and learning OWA operators <i>Konstantinos Papageorgiou, Elpiniki Papageorgiou, Pramod K. Singh, George Stamoulis</i>	Graph-XLL: a Graph Library for Extra Large Graph Analytics on a Single Machine <i>Jian Wu, Venkatesh Srinivasan, Alex Thomo</i>
10.40 – 11.00	Combining Active Learning with Self-train algorithm for classification of multimodal problems <i>Stamatis Karlos, Vasileios G. Kanas, Christos Aridas, Nikos Fazakis, Sotiris</i>	Enhancing Automatic Reasoning of human errors in an operating system using fuzzy logic <i>Konstantina Chrysafiadi, Maria Virvou</i>	A Study of R-tree Performance in Hybrid Flash/3DXPoint Storage <i>Athanasios Fevgas, Leonidas Akritidis, Miltiadis Alamaniotis,</i>

	<i>Kotsiantis</i>		<i>Panagiota Tsompanopoulou, Panayiotis Bozanis</i>
11.00 – 11.20	Model-Agnostic Interpretability with Shapley Values <i>Andreas Messalas, Yannis Kanellopoulos, Christos Makris</i>	Extreme Interval Electricity Price Forecasting of Wholesale Markets Integrating ELM and Fuzzy Inference <i>Manan Bhagat, Miltiadis Alamaniotis, Athanasios Fevgas</i>	A survey of methods for location estimation on Low Power Wide Area Networks <i>Ioannis Daramouskas, Vaggelis Kapoulas, Theodoros Pegiazis</i>
11.20 – 11.40	Spiking Neuron Model with Gamma-distributed Time-varying Synaptic Weights and Variable Thresholds <i>Sashmita Panda, Saswat Chakrabarti</i>	Short Time Wind Forecasting with Uncertainty <i>Petros Karvelis, Stefanos Petsios, George Georgoulas and Chrysostomos Stylios</i>	Elements of game theory in a bio-inspired model of computation <i>Dimitris Georgia Theocharopoulou, Konstantinos Giannakis, Christos Papalitsas, Sofia Fanarioti, Theodore Andronikos</i>
11.40 – 12.00	Local Distortion Hiding in Financial Technology application: a case study with a benchmark data set <i>Georgios Feretzakis, Dimitris Kalles, Vassilios S. Verykios</i>	Exploring deep learning capabilities in knee osteoarthritis case study for classification <i>Elpiniki Papageorgiou, Eirini Christodoulou, Serafeim Moustakidis, Nikolaos Papandrianos, Dimitrios Tsaopoulos</i>	
12.00 – 12.20	Amphitheater	Room A	Room B
	WM-4 Intelligent Prediction Methods and Systems Session Chair: Ch. Stylios	WM-5 Recommender Systems Session Chair: J. Garofalakis	
12.20 – 12.40	Sports Analytics algorithms for performance prediction <i>Konstantinos Apostolou, Christos Tjortjis</i>	Improvement of similarity-diversity trade-off in recommender systems based on a facility location model <i>Antiopi Panteli, Basilis Boutsinas</i>	
12.40 – 13.00	PV Array Fault Detection using Radial Basis Networks <i>Emma Pedersen, Sunil</i>	CFRS: A Trends-Driven Collaborative Fashion Recommendation System	

	<i>Rao, Sameeksha Katoch, Kristen Jaskie, Andreas Spanias, Cihan Tepedelenlioglu, Elias Kyriakides</i>	<i>Maria Anastassia Stefani, Vassilios Stefanis, John Garofalakis</i>	
13.00 – 13.20	Audio Signal Recognition Based on Intervals' Numbers (INs) Classification Techniques <i>Chris Lytridis, Eleni Vrochidou, George Sidiropoulos, George A. Papakostas, Vassilis G. Kaburlasos, Efi Kourampa, Elpida Karageorgiou</i>	Improving Collaborative Filtering's Rating Prediction Coverage in Sparse Datasets through the Introduction of Virtual Near Neighbors <i>Dionisis Margaritis, Dionysis Vassilopoulos, Costas Vassilakis, Dimitris Spiliotopoulos</i>	
13.20 – 13.40	Enhancing SLAM method for mapping and tracking using a low cost laser scanner <i>Alexandros Spournias, Theodore Skandamis, Eleftherios Pappas, Christos Antonopoulos, Nikolaos Voros</i>	Instructional Design in Virtual Reality Environments: The case of Palestinian HEIs <i>Maria Fragkaki, Ioannis Hatzilygeroudis, Zuzana Palkova, Konstantinos Kovas</i>	
13.30 – 14.30	LUNCH		
	Amphitheater	Room A	Room B
14.30 – 16.30	WA-1 Intelligent Prediction Methods Session Chair: E. Papageorgiou	WA-2 Smart Cities, Energy Session Chair: M. Alamaniotis	WA-3 Intelligent Health Decision Methods and Systems Session Chair: S. Mavroudi
14.30 – 14.55	Intelligent Decision Support System for Predicting Students Academic Performance <i>RAHMAN ALI, Fazal Aman, Azhar Rauf, Farkhund Iqbal, Asad Masood Khatak</i>	A Methodology for Saving Energy in Educational Buildings Using an IoT Infrastructure <i>Georgios Mylonas, Dimitrios Amaxilatis, Stelios Tsampas, Lidia Pocero, Joakim Gunneriusson</i>	Clinical profile prediction by multiple instance learning from multi-sensorial data <i>Argyro Tsirtsis, Evangelia I. Zacharaki, Spyridon Kalogiannis, Vasileios Megalooikonomou</i>
14.55 – 15.20	Improving Collaborative Filtering's Rating Prediction Accuracy by Introducing the Common Item Rating Past Criterion	Evaluation of Regression Algorithms and Features on the Energy Disaggregation Task <i>Pascal Alexander Schirmer, Iosif Mporas,</i>	Pigmented Skin Lesions Classification Using Data Driven Subsets of Image Features <i>Iosif Mporas, Isidoros Perikos, Michael</i>

	<i>Dionisis Margaris, Dionysios Vasilopoulos, Costas Vassilakis, Dimitris Spiliotopoulos</i>	<i>Michael Paraskevas</i>	<i>Paraskevas</i>
15.20 – 15.45	Sky Image forecasting with Generative Adversarial Networks for cloud coverage prediction <i>George Andrianakos, Dimitrios Tsourounis, Spiros Oikonomou, Dimitris Kastaniotis, George Economou, Andreas Kazantzidis</i>	Data Mining for Smart Cities: Predicting Electricity Consumption by Classification <i>Konstantinos Christantonis, Christos Tjortjis</i>	Aphasia Diagnosis using Rules with Certainty Factors <i>Georgia Konstantinopoulou, Konstantinos Kovas, Jim Prentzas, Ioannis Hatzilygeroudis</i>
15.45 – 16.10	Applying Long Short-Term Memory Networks for natural gas demand prediction <i>Athanasios Anagnostis, Elpiniki Papageorgiou, Vasileios Dafopoulos</i>	Constructing Virtual Backbones over Low-Cost Wireless Networks for Smart Tourism Services <i>Alexandros Zervopoulos, Vasileios Komianos, Konstantinos Skiadopoulos, Georgios Tsoumanis, Konstantinos Giannakis, Konstantinos Oikonomou</i>	Smart Android Application using Self-Destructive Identities against Cyber Harassment <i>Efthimios Alepis, Constantinos Patsakis, Charalampos Houlis</i>
16.10 – 16.35	An Apache Spark Methodology for Forecasting tourism demand in Greece <i>Gerasimos Vonitsanos, Nikolaos Ntaliakouras</i>	A tool supported framework for the assessment of algorithmic accountability <i>Helen Andriani Tagiou, Yiannis Kanellopoulos, Christos Makris, Christos Aridas</i>	
16.30 – 17.00	CLOSING SESSION		

Tutorial on Machine Learning and the Positive Unlabeled Learning Problem

Kristen Jaskie and Andreas Spanias
SenSIP Center, Arizona State University

Abstract: This tutorial introduces the principles and applications of machine learning algorithms in general, and Positive Unlabeled learning in particular. The tutorial begins with an introduction to the basic ideas, algorithms, and applications of machine learning. After this general introduction, we will focus on the little known, yet important semi-supervised learning problem known as Positive Unlabeled learning (PU learning). PU learning enables classification with only a small subset of labeled positive data. This becomes particularly important in situations when obtaining complete training labels is expensive or impossible. We will present several real-world scenarios, emphasizing signal processing and sensor applications. Algorithms will be presented at a high level, with an emphasis on using pre-built functionality in MATLAB when possible. We will end with a discussion on algorithm and model evaluation. The tutorial includes notes and a survey paper on the Positive Unlabeled learning (PU learning).

Speaker Biographies



Kristen Jaskie is the owner and senior scientist of Data Analytics Consulting LLC. She is a Professor of Computer Science at Glendale Community College in Glendale, AZ. She is also a senior PhD student in Electrical Engineering at Arizona State University, specializing in Machine Learning and Signal Processing. She has a master's degree in Computer Science with a focus in Machine Learning from UC San Diego. Her current research involves creating new machine learning algorithms to solve the Positive and Unlabeled learning problem (PU

Learning), an extremely important semi-supervised classification problem for use in image processing and other applications. Additional research involves both signal processing and machine learning for smart grid energy load analysis. Past research includes developing and applying machine learning algorithms to computer security issues, software defined radio speaker authentication, microscopic cellular image analysis, marketing predictions based on demographic data, species presence using environmental data (one-class classification), and predicting which proteins have certain types of permeable barriers.



Andreas Spanias is Professor in the School of Electrical, Computer, and Energy Engineering at Arizona State University (ASU). He is also the director of the Sensor Signal and Information Processing (SenSIP) center and the founder of the SenSIP industry consortium (also an NSF I/UCRC site). His research interests are in the areas of adaptive signal processing, speech processing, machine learning and sensor systems. He and his student team developed the computer simulation software Java-DSP and its award-winning iPhone/iPad and Android versions. He is author of two textbooks: *Audio Processing and Coding* by Wiley and *DSP; An Interactive Approach* (2nd Ed.). He contributed to more than 300 papers, 7 monographs 9 full patents, 6 provisional patents and 10 patent pre-disclosures. He served as Associate Editor of the *IEEE Transactions on Signal Processing* and as General Co-chair of *IEEE ICASSP-99*. He also served as the *IEEE Signal Processing Vice-President for Conferences*. Andreas Spanias is co-recipient of the 2002 *IEEE Donald G. Fink paper prize award* and was elected *Fellow of the IEEE* in 2003. He served as *Distinguished Lecturer* for the *IEEE Signal processing society* in 2004. He is a series editor for the *Morgan and Claypool lecture series on algorithms and software*. He recently received the 2018 *IEEE Phoenix Chapter award* with citation: “For significant innovations and patents in signal processing for sensor systems.” He also received the 2018 *IEEE Region 6 Educator Award* (across 12 states) with citation: “For outstanding research and education contributions in signal processing.”

Satellite Events

Project Track

During IISA 2019 conference, an independent satellite event called "Project Track" is organized and takes place on Tuesday 16 July. The Project Track offers an opportunity for project dissemination and is organized by the University of Patras.

Industrial Track

Also, an Industrial Track session will independently take place during the conference, depending on whether local companies express their desire to present innovative products and services.

Social Events

Welcome Cocktail event

The Welcome Cocktail will take place on Monday 15, in the evening at the conference venue.

Gala event

The Gala Event will take place on Tuesday 16 at night and will be a splendid yet relaxed event taking place at the University of Patras.

The bus of the University of Peloponnese will offer a lift from the hotels to the University of Patras

About Patras

Patras is located in Western Greece and is well known for its amazing natural beauty. It constitutes a bustling city, proud to host renowned scientific, academic and research communities in the fields of Science, Technology and Intelligent Systems. Patras is a city where entertainment, history and culture mingle together to create a destination filled with wonderful discoveries.

At the entrance of the city, one of the world mega bridges, the Rio-Antirion Bridge stands impressive, a modern “wonder” worthwhile visiting, which bridges Peloponnese (Southern Greece) to Central and Northern Greece.

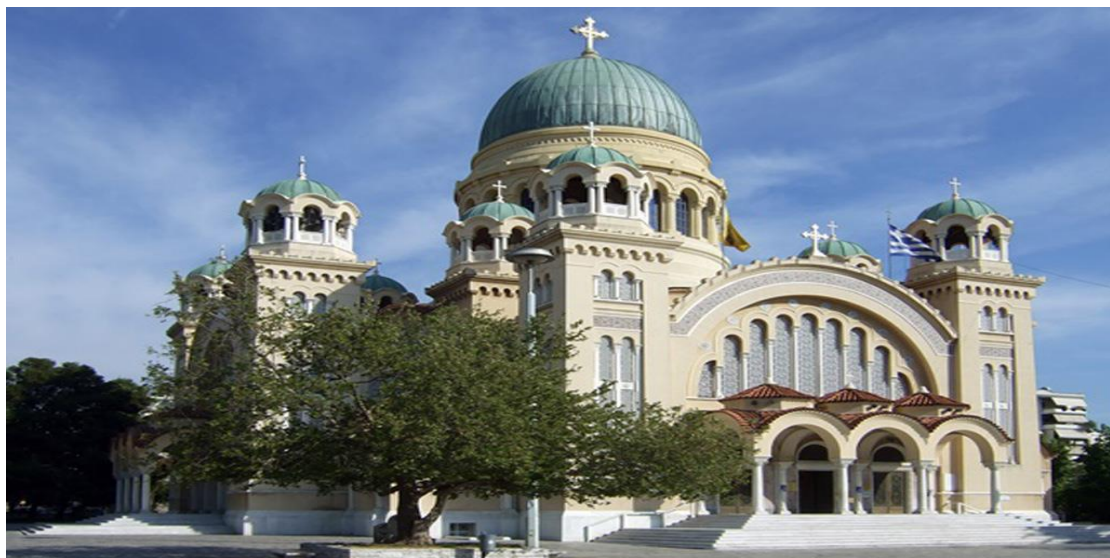


The exploration around the city starts from Ag. Nikolaou famous pedestrian street. There, 192 steps await to lead the visitors to the Old City. A romantic stroll around its cobbled streets reveals grand colorful neoclassic mansions, reminders of the city’s glorious past. The exploration continues with the visit of the city’s Medieval Castle, built in the second half of the 6th century A.D. on the ruins of the ancient Acropolis. Its walls enclose an area of about 22 sq.m.; it consists of a triangular external compound enhanced with towers and ramparts which give way to a breathtaking city view.



West of the Acropolis, in the “Áno Póli” (upper city), visitors find Patras Roman Odeum, built earlier than the Athens Odeum (Herodion 160 AD). The geographer Pausanias, who visited Patras in 170 AD, wrote: “It has the most beautiful decoration I have ever seen, excluding of course that of Athens”. The surrounding space is an archaeological area where mosaics, sarcophagi and other ancient findings are displayed. Romantic souls should seek for the city’s landmark, the Lighthouse, in order to enjoy a breathtaking panorama of the port.

In the center of the city, a main historical monuments that draw tourists’ attention is the Saint Andrew Church, one of the biggest churches in the Balkans. St Andrew was a busy bee as far as Apostles go. He visited Byzantium and ordained the first bishop of what would later become the patriarchate of Constantinople. He travelled around the Black Sea in today’s Georgia, Romania, Crimea and the Ukraine. Descending through modern Greece to the Peloponnese, he stopped at Patras to preach Christianity. He was tortured to death in Patras on an X-shaped cross in 66 AD. The st. Andrew church contains the Holy Skull, the Holy Cross and the Finger of Saint Andrew.



The “APOLLON” Municipal Theatre that is located in the city center, constitutes one of the first opera houses in Europe. It was designed in 1872 by the notable German architect Ernest Ziller. Since 1988 it permanently houses the Patras Municipal Regional Theatre.

Patras is one of the Greek cities that never sleeps. “Follow its rhythm” is its moto. A morning visit includes walks around the city’s squares: Georgiou, Olgas or “Ypsilá Alónia” (meaning high raising plateau), and the city’s beautifully restored neoclassical buildings. It also includes visit of the city’s museums: the New Archaeological Museum, the Folk Art Museum, or the Museum of History and Ethnology. Visitors can equally discover Patras shopping area, and shop their hearts out! They can enjoy a fine meal and relax at a lounge café. When night sets in, they can observe how the streets of the city are transformed into venues of fun. Patras nightlife awakens.

Exploration of the city can not be completed without a visit to the Achaia Claus winery, which is located on a green hill 8 km south-east to the center of the city. Visitors are impressed by the stone buildings, the huge oak barrels, containing century-old mavrodafni, the traditional wine cellar and the unique scenery with the magnificent view.

Patras is the ideal touristic base. It is located right in the center of the triangle of 3 of the most famous destinations of ancient history, Delfi, Ancient Olympia and Epidaurus. The Mycenaean park of Vounteni also in Patras, is one of the most important facilities of Mycenaean civilization internationally.

Patras also offers one of the most beautiful sunsets in Europe. You can easily enjoy it in a number of places next to the sea or higher on the hills.

Patra is notable for its clean, blue, sandy beaches, some of which are among the most beautiful of Greece.

Conference Coordinators



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