1ˢᵗ H2020 YADES Training School

in Conjunction with

1st International Conference On
Novelties in Intelligent Digital Systems

This Year Topic: "Identification of methods for CH risks assessment- Part I"

30 Sept.-2 Oct. 2021
Athens, Greece

Nowadays, the impact of the Climate Change (CC) in our societies is becoming more and more evident with a dramatic increase of extreme weather phaenomena (long periods of droughts, heavy rainfalls, prolonged heatwaves, extreme windy conditions) which, in the sequel, have drastically increase in the number and the intense of floods, fires causing natural disasters both for the civil infrastructures and the natural landscape. Among different man-made constructions, the old, traditional, buildings, monuments, churches, or even entire blocks of historic cities, which constitute a major part of our cultural identity, is the most vulnerable. Recent studies highlight the potential impact of Climate Change (CC) and other geo-hazards (such as landslides and earthquakes) on historic cultural heritage (CH) sites and monuments, which in turn yield significant adverse impacts on economies, politics and societies. Up today, there is no specific process towards understanding and quantifying CC effects on historic areas; combined with the limited strategies on CC-related issues, it becomes difficult to assess quantitatively and qualitatively the impact of various climatic and other parameters on the CH sites.

On the other hand, the recent advances in Artificial Intelligence (AI) and Machine Learning (ML) have stimulated a smart processing and analysis of large volumes of, even heterogeneous and temporally variable, data (big data) assisting scientists, policy makers and the authorities to take more rapidly concrete decisions on the actual effects of weather conditions and the climate on CH sites. Deep learning methods, in various forms ranging from deep non-linear structures and convolutional processing elements, to long short-term memories and adversarial learning, are some recent well promising examples of intelligent processing which can aid in the analysis of the degree of material degradation, forecast its temporal deterioration and assess the volume of a damage for the historic CH buildings so that resilience actions can take place.

This great research topic is covered by the 1ˢᵗ training school of the H2020 MSCA project YADES "Improved Resilience and Sustainable Reconstruction of Cultural Heritage Areas to cope with Climate Change and Other Hazards based on Innovative Algorithms and Modelling Tools" grand agreement 872931 organized in conjunction with the NIDS 2021 "International conference on Novelties in Intelligent Digital Systems". The goal of the school is to train PhD students, scientists, policy makers, SME representatives and any other interesting person in novel intelligent techniques for the identification of risks in CH sites, monuments and historic cities along with resilience actions to mitigate these risks.

The school will last three days and will be open to (i) all YADES consortium members (ii) YADES collaborated projects members of which will be invited to participate, and (iii) to relevant scientific society.

The lectures of the first two days will be covered by the topic of the NIDS 2021 conference, that is, from 30 September 21 to 1 October 21. The third day, that is the 2 October 21 will be only dedicated by presentations from YADES project members and potential external keynote speakers on CH issues. A detailed programme will be announced shortly.

Programme of
1st H2020 Yades Training School
in conjunction with NID'21 Conference
30 Sept. 2021 - 2 Oct. 2021

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Training School Programme

Thursday 30/9/2021
The same programme as NIDS'21 Conference.

Friday 1/10/2021
The same programme as NIDS'21 Conference.

Saturday 2/10/2021	
Schedule	**Lecture Title**
10:15-10:30	School Opening
10:30-10:45	Training School Welcome and Programme Outline Prof. Nikolaos Doulamis, YADES Coordinator

10:45-11:45	## Climate Change and Cultural Heritage: YADES Project Dr. Matthaios Bimpas, YADES Project Manager **Presenter's Short CV:** *Dr. Manthos Bimpas (M) has obtained his BSc. in Electrical and Computer Engineering from the National Technical University of Athens (NTUA) on 2000. His PhD (NTUA, 2004) examined innovative radar techniques in terms of system and antenna design with special emphasis on sensors-based applications and fusion analysis. His main interests lie to the integration techniques of various sensing elements and communication/networking solutions mainly for security and environmental applications. He has been successfully involved in many European projects dealing with radar sensors, telematics, communication systems and data processing, including the setting up and submission of the following EC co-funded projects: LEAKING (FP5- technical manager), HUMABIO (FP6-ICT), WATERPIPE (FP6-ENV- deputy coordinator), MONICO (FP7-SME- technical manager), MEMSCON (FP7-NMP- technical manager/deputy coordinator), eVacuate (FP7-SEC), PPDR-TC (FP7-SEC), RECONASS (FP7-SEC- deputy coordinator), ICeWATER (FP7-ICT), ZONESEC (FP7-SEC, quality manager), INACHUS (FP7-SEC, technical manager) and many other. He has actively participated in more than 25 EC funded and national projects during the last 12 years. He has published a number of articles in Scientific Journals and Conferences on sensor related topics and has acted as a reviewer in 2 Journals on the same topic. He is acting as a reviewer and an evaluator for the EC research proposals.*
11:45-12:45	## Culinary aspects of multi-hazard resilience for cultural heritage Prof. Dimitris Vamvatsikos **Presenter's Short CV** *studied at the National Technical University of Athens (Diploma, 1997) and at Stanford University (MSc 1998, PhD 2002). His research interests are focused on integrating structural modeling, computational techniques, probabilistic concepts and experimental results into a coherent framework for the performance and risk assessment of bridges, buildings, ports and wind turbines under earthquake, wind, wave or blast loads. His seminal work in risk assessment via Incremental Dynamic Analysis has received wide attention leading to more than 2400 citations (Scopus: Aug/2018), placing him among the top cited civil engineers worldwide. He has co-operated with leading structural engineering firms (ARUP, Halcrow/CH2M), the oil industry (Shell, ExxonMobil), catastrophe risk modelers (AIR Worldwide, RED Srl) and the insurance/reinsurance industry (Munich RE, AXA Insurance). His research group also enjoys strong ties with US and EU institutions that lead the research in risk management under natural hazards. Dr. Vamvatsikos has worked closely with the Applied Technology Council (ATC) and performed research for the Federal Emergency Management Agency (FEMA-P440A guidelines) and the US National Institute of Standards and Technology (NIST-GCR-10-917-9 US seismic assessment guidelines). He is a long-time collaborator of the Global Earthquake Model (GEM) Foundation and has contributed to the development of the OpenQuake engine used worldwide for loss estimation and the GEM vulnerability assessment guidelines and the Risk Modeler's Toolkit. He is a recognized expert in earthquake engineering, recipient of two international awards, reviewer of most top civil engineering journals and a regular keynote lecturer in international conferences.*
12:45-13:45	## Integrating Green Infrastructure into urban cultural heritage sites Prof. Julia Nerantzia Tzortzi & Dr. Maria Stella Lux **Presenter's Short CV** *Julia Nerantzia Tzortzi (female), is associate professor at the Department of Associate Professor Department of Archi- tecture, Built Environment and Construction Engineering of Politecnico di Milano and Board Member of the PhD Committee of the Department. She has a 5 yeasrs Bachelor in Forest Engineer (Aristotle University of Thessaloniki), Master in Landscape Architecture (University of Newcastle Upon Tyne) and PhD in Bioclimatic Landscape Architec- ture (Aristotle University of Thessaloniki). She has established the Master of Landscape Architecture (MLA) at Nea- polis University as Coordinator of the Master and as Head of the Department of Architecture, Land and Environmental Sciences of Neapolis University of Pafos. She is Board Member of LE:NOTRE INSTITUTE, Member of AIAPP (Italian Association of Landscape Architecture), Charter Member of Landscape Institute (UK), member of IFLA (In- ternational Federation of Landscape Architects), where she is active in the IFLA WGs: "UIA / IFLA Working Group Indigenous Ecosystem Corridors and Nodes" and "Cultural Landscapes", Member of Landscape Research Group and she was Vice President of the Panhellenic Association of Landscape Architects-PHALA (2003-20). She has served for 15 years as Executive Professional in Landscape Architecture at the Ministry of Environment, Urban Planning and Energy – Climate Change of Greece. She has published 92 scientific papers and four edited books. She has been principal investigator to more than 30 European and other research Programmes.*
13:45-15:00	## Lunch Break
15:00-16:00	## **Keynote Speech:** Learning-based Bathymetric Mapping for Shallow Coastal Waters using RGB imagery Dr. Panagiotis Agrafiotis **Presenter's Short CV** *Dr. Panagiotis Agrafiotis holds a M. Eng. Diploma in Rural and Surveying Engineering, an M.Sc. in Geoinformatics and a PhD in the area of Remote Sensing and Machine Learning from National Technical University of Athens (NTUA). During his studies, he earned various awards and travel grants for conferences and a full PhD Scholarship from NTUA. He is currently doing research in the areas of 3D Computer Vision, Remote Sensing and Machine Learning, focusing on image-based bathymetric mapping, seabed image analysis and RGB and hyper-spectral image matching using CNN filters. In December 2020, his team 3[Deep]Vision, won the 1st Prize of the integrated Geomatics solution awarded by the European GNSS Agency for their proposal "Bathymetry from UAV Imagery and Machine Learning". The last 9 years he lived in Greece and Cyprus, working in more than 16 research projects as a researcher at the Photogrammetric Vision Lab. of CUT, the Lab. of Photogrammetry of NTUA and the Institute of Communication and Computer Systems (ICCS) of the School of Electrical and Computer Engineering (ECE) of the NTUA, with the responsibility of applied computer vision algorithms design, overwater and underwater 3D reconstruction, machine learning, laser scanning, cameras calibration and person detection and tracking for survivor localization on optical and thermal imagery. He is the author of 36 scientific publications and he has served as a reviewer in 21 journals of high impact factor. He is currently the secretary of the ISPRS WG II/9: Underwater Data Acquisition and Processing.*

16:00-17:00	**Machine Learning Tools in Engineering**
	Prof. Nikolaos Doulamis
	Presenter's Short CV Prof. Nikolaos Doulamis (Male) received the Diploma degree in Electrical and Computer Engineering from the National Technical University of Athens (NTUA) with the highest honour and the PhD degree in electrical and computer engineering from NTUA. He joined the Image, Video and Multimedia Lab of NTUA as research assistant. His PhD thesis was supported by the Bodosakis Foundation Scholarship. Since 2005-2008, he was visiting professor at the National Technical University of Athens. He is now tenured Assistant professor at the NTUA. Dr. Doulamis was awarded as the Best Greek Student in the field of engineering in national level by the Technical chamber of Greece. He was received the Best Graduate Thesis Award in the area of electrical engineering. During his studies he has also received several prizes and awards from the National Technical University of Athens, the National Scholarship Foundation and the Technical Chamber of Greece. In 1997, he was given the NTUA Medal as Best Young Engineer. He is author of more than 280 articles in the area of multimedia and computer vision. More than 55 of them are journal papers of impact. He received more than 3200 citations. Prof. Nikolaos Doulamis is currently involved in many European Projects like, eVacuate IP, ROBOSPECT, ZoneSec, VIMSEN, INACHUS and the national projects Viopolis, Pericles, Endecon. He was also involved in many other European research projects, such as SOCIOS, OLYMPIC, e-Director, Saragen, GRIA, GRIBLAD, AKOGRIMO in the area of multimedia processing. He has served as general program chair of the 1st ACM AREA, and all the ARTEMIS workshops. He is also general chair of more than 10 workshops in this area and TPC in more than 40 conferences.