

DAILY PROGRAM
KEYNOTE SPEECH

KEYNOTE, SPONSOR PRESENTATIONS			
POSTERS SESSION		COFFEE BREAK	
Room Plenary	Room Exhibition	Room Multipurpose	
09:00-10:30			
10:30-11:00			
11:00-12:30	TS1 - 3D Documentation, Preservation and Analysis of Heritage Sites in Central America	TS2 - 3D Surveying and Modeling of Heritage Vaults	TS3 - International Cooperation for Heritage Documentation and Conservation II
12:30-13:30	LUNCH BREAK		
13:30-14:30 POSTERS SESSION II			
Room Plenary	Room Exhibition	Room Multipurpose	
14:30-16:00	TS4 - Developments and Investigations in 3D Reconstruction	TS5 - VR & AR in Heritage	TS6 - Panel on "Ethics for Heritage Recording Specialist's"
16:00-16:30 POSTERS SESSION			
Room Plenary	Room Exhibition	Room Multipurpose	
16:30-17:45	TS7 - Handheld and Mobile 3D Scanning	TS8 - Heritage Places and Data at Risk	TS9- Learning, Knowledge Transfer and Training in CH
20:00 GALA DINNER			

Francesco Fassi (Politecnico di Milano, Italy): SURVEY COMPLEX ARCHITECTURE WITH A METROLOGICAL APPROACH: CHALLENGES AND SCOPES



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INTERVIEW

MARIO SANTANA (Carleton University, Canada)

- APPLYING ETHICS TO HERITAGE RECORDING SPECIALISTS IN CONSERVATION OF OUR HERITAGE -



Recording the physical characteristics of our world heritage is a cornerstone of preventive maintenance, monitoring and conservation. The information produced by such workflows guides decision-making by property owners, site managers, public officials, and conservators. Rigorous documentation may also serve a broader purpose: over time, it becomes the primary means by which scholars and the public apprehend a site that has since changed radically or disappeared. The development of ethics principles (or a code of ethics) applicable to the heritage recording specialist in their conduct, responsibilities, professional practice and for the benefit of the public and communities is of paramount importance. In any professional association that serves the public interest, members have to abide by a number of ethical principles, and this is currently missing in the heritage recording field. As it is a long history of existence, working towards best practice and innovation, CIPA is taking the leadership to develop and adopt policies. A regulatory code of ethics framework would allow better planning, recording, processing and dissemination of digital workflows for the conservation of historic places. Furthermore, this framework should encourage sharing and preserving records among heritage organizations around the world to ensure the transmission to present and future generations of the information documented. But also, preventing the violation of the privacy and rights of communities living in those heritage places, where digital data of their culture will be shared over the internet without their permission. This will prevent the perception of digital appropriation or colonialism. Finally, an ethical commitment will also ensure that heritage recording specialists should have appropriate qualifications, such as certification or university training. As well as, the commitment of heritage recording specialists to professional development and their participation in specialist conferences (such as CIPA symposiums) in order to present their approaches and obtain valuable feedback.

INTERVIEW

FABIO REMONDINO (FBK Trento, Italy)

- THE HYPE OF MACHINE AND DEEP LEARNING -



Q: Fabio, what are machine and deep learning (ML/DL)? A: ML/DL are statistical learning and inferring methods (within Artificial Intelligence field - AI) used to take decisions and perform tasks (e.g. autonomous driving, image segmentation, point cloud classification, etc.) based on previously provided or acquired knowledge. This knowledge is provided by means of training data and extracting some specific features or attributes. In ML the features are handcrafted from the available data and a classifier is applied to perform the task (e.g. find all windows in a picture). ML does not require too many data for the training step but it heavily rely on prior features that the user has defined/selected/provided. Contrary, in DL (a sub-category of ML), a dedicated deep neural network learns the features from the available data with its neural network layers and then performs the task (e.g. classify a point cloud of a building's facade in columns, windows, etc.). DL is so able to learn from itself but it is data and resources hungry. ML/DL methods offer new and exciting possibilities for geometric questions in photogrammetric and laser scanning point clouds or for semantic image interpretation. They are playing an interesting and important role in these disciplines and they could serve very well the heritage field.

Q: Why there is a hype nowadays? A: The abundance of training data (e.g. internet images), in combination with new powerful hardware (GPU) and technical improvements in neural networks, have led to a return and blooming of AI

methods (in particular deep learning). For sure there is a large hype nowadays around ML and DL, pushed by the media, with an over-use of such methods. Doubtless they can solve many problems, but they are often used as black-boxes and depending on a large quantity of training data. They are very powerful and could be super useful also in the heritage field, but we need to take and use these methods carefully, fully understanding their behaviour and results.

Q: Why are they slowly being introduced also in the heritage field?

A: ML/DL approaches are significantly improving the performance of many tasks compared to more traditional approaches. Therefore they are getting of high interest in various disciplines, including heritage, where automatic data classification and interpretation methods would be very much appreciated. But so far, ML/DL methods, in particular the unsupervised ones, are generally not reaching good results with heritage data. This is mainly due to: (i) the classes definition in the heritage field can be really variegated, i.e. several classes could be identified based on different purposes (e.g. materials, deterioration areas, construction phases, etc.); (ii) not always a precise shape or colour corresponds to a semantic architectural class; (iii) there is a lack of training data in the heritage community, such as segmented images of historical buildings, classified point clouds of columns, etc. Therefore, case-by-case, different geometric and radiometric features are generally extracted to train a model able to predict then the classification of the entire dataset. In the next years, with more training data available and cross-disciplinary research activities, ML/DL methods will for sure take-off also in the heritage sector, which is generally reluctant to changes due to tradition and mentality. It is only a matter of collaboration with colleagues in neighbouring disciplines and acceptance of innovation for data interpretation and analysis. A task that CIPA could facilitate!

INTERVIEW

PIERRE GRUSSENMEYER (*INSA Strasbourg, France*) - 3D DOCUMENTATION OF WWI / WWII SCENARIOS -



Research related to the World Wars (WW) Heritage is nowadays taken into consideration by archaeologists. These researches, initially focused on funeral practices, are now more diversified and confronted with all the available historical sources, sometimes in considerable quantities (testimonies, photographs, engravings, graffiti, sculptures, maps, etc.).

Q: Pierre, what kind of projects do you carry out in relation to WW?

A: We are working with Gilles Prilau who is a leading French archaeologist of the WWI. For many years, he has been working in the battlefields of the Western Front in France. During his work in the underground city beneath the French town of Naours in 2013, he discovered the names and regimental numbers of WWI soldiers scrawled on the limestone walls. Many of them were Australian. These graffiti usually include the date of passage, surname, first name, personnel number, battalion number, country of origin and sometimes also the soldier's town. A total of 3200 inscriptions have been recorded in Naours, including 2200 Australian inscriptions: "it is the largest concentration of underground military inscriptions, in any case in the same place, on the entire western front. If you look at them carefully, you will notice that the limestone surface has been prepared with a knife, and that letters have been written on it with a wooden pencil". Other inscriptions have also been found in underground tunnels or quarries in the Northern part of France. Gilles Prilau suggested that we record several sites together (the underground city of Naours, the Maison Blanche Souterraine near Arras (presented at CIPA 2017), the underground tunnels of Bouzincourt, the quarries of Machemont). This documentation is very important as in the North of France, the sites are made of limestone and very fragile and are therefore likely to disappear.

Q: How do you manage the 3D documentation and what are the deliverables?

A: We digitize all the sites using laser scanning techniques in order to have a point cloud to visualize the volumetry of each site (one point per cm). Details such as graffiti, sculpted works, engravings are accurately recorded by photogrammetry in order to digitize the smallest details providing very dense colored point clouds. Point clouds and photos are the basic archives. All the 3D data is georeferenced with GNSS points and linked to the French National Reference System, allowing all data to be merged into a unique point cloud. For each project, we also produce a 5-minute video for the public that presents the volumetry of the site but above all tells the story of a selection of soldiers based on their graffiti or sculpture works. The scenario of the video is a teamwork between the archaeologist, the local organizations, the historians and the Photogrammetry and Geomatics Group from INSA Strasbourg. We also offer access to the sites that are often inaccessible to the public through Virtual Reality presentations. Our 3D documentation therefore highlights "The Lives behind the Names".

20:00 GALA DINNER @ Cuatro Postes Hotel / Restaurant, Catra. Salamanca 21, Avila