

Vienna 28 April, 2016

WORKSHOP

The CIPA Workshop on Saving the Heritage of Syria



THE CIPA WORKSHOP ON SAVING THE HERITAGE OF SYRIA BEST TECHNIQUES AND METHODS FOR DATA CAPTURE, STORAGE AND DISSEMINATION

Hazards for tangible cultural heritage, such as historical and archaeological remains, can vary from natural catastrophes, environmental changes to human caused mismanagement and destruction. The importance of detailed documentation especially actualizes in the areas and cases that have become neglected and have faced destruction or loss. A strategy that can adapt the heritage documentation in 3D is needed. CIPA under ICOMOS (International Council on Monuments and Sites under UNESCO) and ISPRS (International Society of Photogrammetry and Remote Sensing), is providing expertise in developing the best technical means for heritage documentation. The aim of this workshop is to provide this expertise to save and revive the heritage of Syria and to share ideas for the benefit of comparable cases. The Near East has been under severe turmoil over the past years, and Syria like Iraq has become the battlefield of various groups. This cradle of human civilization has faced war, destruction and looting of its heritage, the heritage that also belongs to the whole humankind. Remote-sensing, 3D technologies and methods based on laser and digital data capture are increasingly showing their applicability and potential to trace, retrieve and save valuable information to be studied and left for posterity.

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Impact of the Crisis in Syria on Archaeology, Results and Suggestions

Ammar Abdulrahman, University of Konstanz, former Director of the Archaeological Excavations in Syria (DGAM – Directorate-General of Antiquities and Museums, Syria)

It is not new to mention, how important the antiquities of Syria are and how they truly share a major part of the world cultural heritage. In Syria we have a sequence of history from prehistory to modern times, without interruption also witnessing main cultural revolutions such as the invention of agriculture as well as writing.

After the Arab uprising a lot of archaeological sites and monuments have been affected and also in somehow it has been harmful for Archaeology as a science. All the archaeological missions, foreign and national, have been cancelled. Also a lot of professors have lost their positions for different reasons not being able to attend their lectures, and after a while they were fired. On the other hand the students were also not able to attend the seminars and the activities, and in some hot areas, especially those that are out of the government control, they stopped their whole educational system.

The harmful destruction that occurred in the last five years was due to several reasons, and the most important is what have been done by ISIS, especially after their seizing 50% of the space of Syria. All this was faced from some local society with a high degree of responsibility, and they have succeeded in safeguarding a lot of sites and museums. All this would continue without an international interfere in order to prevent this cultural massacre.

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The UNESCO Project “Emergency Safeguarding of the Syrian Cultural Heritage”

Cristina Menegazzi, Head of the UNESCO-Syria project in Beirut and Dr. Ana Almagro-Vidal, CIPA, Fundación Montemadrid

The sad and dramatic events happened in Syria in the last 4 years of conflict have brought to the forefront the debate on how to protect, safeguard and document Cultural Heritage in conflict areas. Syrian heritage places have become battlefields, sources of illicit trafficking and lately deliberate targets of destruction because of what they represent in terms of cultural values.

These events require an international response, collaboration and effort to seek for ways to preserve the memory of these places. The UNESCO project “Emergency safeguarding of the Syrian Cultural Heritage” is tackling this crisis situation from many different fronts. One of this aspects is through technical assistance to Syrian professionals with the help and support of specialized experts.

The project, launched in February 2014, is developed following a triple approach:

- Monitor and assess the cultural heritage situation in Syria through updated and continued knowledge and documentation through the establishment of an International Observatory of Syrian Cultural Heritage
- Mitigate the destruction and loss of Syrian cultural heritage through national and international awareness-raising efforts
- Protect and safeguard Syrian cultural heritage through enhanced technical assistance and capacity-building for national stakeholders and beneficiaries.

In this sense the project is developing a series of training activities as well as technical meetings with Syrian professionals and stakeholders. Part of the action taken so far regarding built, movable and intangible heritage is the identification of the different needs and approaches that they require to document, assess and monitor cultural heritage, track losses and destruction, as well as enable the national cultural heritage stakeholders to be operational and accurate, not only during the conflict but also when planning post-recovery actions.

Science vs. Darkness: a Utopian View?

Frank Braemer, CEO, SHIRIN

s h i r i n is an initiative from the global community of scholars active in the field of archaeology, art and history of the Ancient Near East. It brings together a significant proportion of those international research groups that were working in Syria prior to 2011, with the purpose of making their expertise available to wider heritage protection efforts. Accordingly, its International Committee includes the directors of a number of long-term international research programmes, and others who share their strong commitment to the effective protection of the heritage of Syria.

This s h i r i n committee was created in response to a request by the participants at the *9th International Congress on the Archaeology of the Ancient Near East*, in Basel, Switzerland, on June 10th, 2014, during a special workshop funded by the *Swiss Society for Ancient Near Eastern Studies* (SGOA). It seeks to represent the broad sweep of archaeological and historical research in Syria and is supported by the directors of research programmes active in neighbouring countries.

Representing the major institutions, universities and research centres in Europe, North America, Oceania, Eastern and Western Asia, the main purpose of s h i r i n is to support governmental bodies

and non-governmental organizations in their efforts to preserve and safeguard the heritage of Syria (sites, monuments & museums). It will take account of, and respond to, the needs of Syrian colleagues and authorities regardless of their political, religious or ethnic affiliation, in particular with respect to emergency steps and measures.

Composed of scholars who have, individually, a deep knowledge of the field, and collectively cover all regions of Syria, it will activate local networks in order to support, when possible, concrete actions to ensure the payment of the official site guardians and the protection of the excavation houses and storage depots. s h i r ī n – with the help of official and non-governmental bodies – will collect information on damage resulting from the current conflict and identify those cases in which emergency repairs or protective action may be required.

s h i r ī n will also collaborate on the creation of a comprehensive database of elements of Syrian heritage. This will provide a basic core of knowledge to which evidence of damage can be added on a case-by-case basis, and will allow the evaluation of the overall pattern and scale of damage resulting from the conflict, as it presents across different regions of Syria and the various classes of monument. It will thus propose a key source of information that can be made available to those involved in heritage protection at a local level, so that they have the necessary knowledge to prioritize heritage protection efforts in a systematic manner.

s h i r ī n also includes members with long and deep experience of architectural and artefactual restoration, and specialists in all the periods of the history and prehistory of Syria. By involving the international research community now, we intend that this capability will be fully formed and thus ready to support the local authorities and communities when the emphasis shifts from safeguarding and the documentation of damage, towards restoration and reconstruction.

Experience and expertise acquired by the members of the s h i r ī n Committee might as well be of some help in evaluating the provenience of illicitly excavated or purchased artefacts and artwork.

The ASOR Cultural Heritage Initiatives: The Cultural Heritage Crises in Syria and Northern Iraq

Michael Danti, FSA, University of Boston, ASOR – the American Schools of Oriental Research

Years of civil war in Syria and the seizure of much of northern Iraq and Syria by extremists have precipitated what is currently the world's largest humanitarian crisis. While the international community must focus foremost on ending the conflict and meeting basic human needs, protecting the region's irreplaceable cultural heritage forms an integral and inextricable part of humanitarian efforts. Looting, deliberate destructions of heritage places by extremists, combat damage, and illegal development occur daily in Syria and northern Iraq and are obliterating the cultural patrimony of millennia. Extremists are systematically disassembling the heritage sector in the conflict zone and seek to stamp out cultural diversity in what is nothing short of a war on culture. These crimes threaten to proliferate and spread the conflict, complicate peace efforts, and erode future stability and prosperity. Cultural identities and the futures of countless vibrant communities hang in the balance. To help to address these challenges, the U.S. Department of State and the American Schools of Oriental Research completed a cooperative agreement in August 2014 forming the ASOR Cultural Heritage Initiatives.

Partnership for Safeguarding Cultural Heritage in Syria, Yemen and Iraq: Collaboration between ICOMOS and CyArk

Samir Abdulac, ICOMOS / Bijan Rouhani, ICOMOS-ICORP-Blue Shield / Elizabeth Lee, CyArk / Mario Santana Quintero, CIPA-ICOMOS, University of Carleton

Given the dramatic events in Syria, Yemen and Iraq, as well as, other imminent sites in the region, ICOMOS has adopted the Resolution 18GA 2014/21 for the safeguarding of cultural heritage in Syria and Iraq at its General Assembly in Florence, which indicates “with significant concern, the tragic impact of the on-going armed conflict in Syria since March 2011, which has led to a grave loss of every type of cultural heritage in Syria, including old cities, historical monuments, archaeological sites and collections”.

For this reason a working group has been established for the coordination with other national and international stakeholders, conduct active monitoring, organize meetings and awareness events, as well as, to channelling information to other ICOMOS members and the public.

Furthermore, the working group has actively participated in capacity buildings activities, provide advice, assistance and the preparation of Action Plans. In this line, also ICOMOS with the contribution with its scientific committees, especially ICORP and CIPA has agreed to conduct a pilot project with Cyark Foundation to mobilize high tech documentation tools to record sites in Iraq and Syria.

Techniques and Methods in Archaeological Remote-sensing for Cultural Heritage Documentation

Michael Doneus, CIPA, University of Vienna

A large part of our cultural heritage is still buried in the ground and remains undetected. This makes it vulnerable to any kind of destructive activities, as erosion, construction works, or looting. Therefore, archaeologists and heritage managers have to apply methods that allow to detect and document archaeological sites over large areas.

Archaeological remote sensing provides an important foundation for any kind of spatial archaeology (settlement-, environmental- or landscape archaeology), including the main methods of archaeological site detection and identification.

Aerial photography is a very cost-effective method for site discovery with the potential to provide detailed maps of archaeological structures. Large numbers of vertical and oblique images are stored in archaeological archives. They provide great archaeological potential, but in order to make use of their archaeological potential, the photographs have to be interpreted and mapped. Therefore, semi-automatic ortho-rectification of aerial photography is a hot topic of research.

Current standard imaging techniques do often not allow the detection of crop-marks if the contrast is too low within the range of the visible spectrum; a problem that may be solved using airborne imaging spectroscopy (also called airborne hyperspectral scanning). The scanning systems divide a part of the electromagnetic spectrum into a large number of electromagnetic bands, which all can be analysed individually. Therefore, a detailed investigation of those parts of the plant’s spectral signature, which are most crucial for indicating stress, is possible.

Over the past few years, airborne laser scanning has, due to its active sensing principle (in contrast to photogrammetry and AHS) turned out to be a potential tool for recognition and measurement of archaeological and palaeoenvironmental features that survived in the topography in open and

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wooded areas. Aside from geometrical information ALS additionally provides radiometric information (typically near-infrared), which adds another source of information on buried archaeological sites.

Finally, in recent years, airborne topo-bathymetric laser scanner systems are able to measure surfaces above and below the water table over large areas in high detail using very short and narrow green laser pulses, even revealing sunken archaeological structures in shallow water.

The proposed lecture will focus on its potential and recent developments of the mentioned techniques.

On the Possibilities for Crowdsourcing and Automated Structure from Motion (SfM) Algorithms for Cultural Heritage Documentation

Andreas Georgopoulos, CIPA, NTUA - National Technical University of Athens

Cultural Heritage all over the world is at high risk. Natural and human activities endanger the current state of monuments and sites, whereas many of them have already been destroyed especially during the last years or are situated in hazardous environments. Very often in situ preventive, protective or restoration actions are difficult or even impossible, as e.g. in cases of earthquakes, fires or war activity. Digital preservation of cultural heritage is a challenging task within photogrammetry and computer vision communities, as efforts are taken to collect digital data, especially of the monuments that are at high risk. Visit to the field and data acquisition is not always feasible. To overcome the missing data problem, crowdsourced imagery is often used to create a visual representation of lost cultural heritage objects. Crowdsourcing has become possible with the advancement of the web technologies and the wide spreading of social media. Initiatives to collect imagery data from the public and create visual representations of recently destroyed or not monuments are presented and discussed in this study. Such digital representations may be 2D or 3D and definitely help preserve the memory and history of the lost Heritage and sometimes they also assist studies for their reconstruction.

Databases and their Use for Protecting and Preserving the Tangible Heritage of Syria

The CIPA Database for Saving the Heritage of Syria

Fulvio Rinaudo, CIPA, Polytechnic University of Turin / Minna Silver, CIPA, Mardin Artuklu University

CIPA, a joint organisation of ICOMOS and ISPRS, is contributing with its technical knowledge in saving the heritage of Syria. CIPA is constructing an open access database based on the data that CIPA and its members have collected during various projects in Syria over the years before the civil war broke out. In this way we wish to support the protection and preservation of the environment, sites, monuments and artefacts and the memory of the region that has been crucial for the human past and the emergence of civilizations. This will hopefully provide aid to revive the cultural heritage of Syria as much as it can be done after the destruction, damage and loss that has been taking place during the conflict. The idea is based on saving and providing the recording and documentation in digital data form for conservation, studies, analyses, dissemination and storage to serve institutions, organisations, cultural management stakeholders, individual researchers and private enthusiasts.

Site Damage Databases: A Comparative Review

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Robert Bewley / Emma Cunliffe, EAMENA - Endangered Archaeology in the Middle East & North Africa,, University of Oxford

Recent conflicts across the MENA region have caused catastrophic damage to a growing number of archaeological and heritage sites. However, they are also threatened by increases in development, agriculture, and other more peaceful activities. Some of this damage has been widely publicised, enabling groups to record site details and conduct condition assessments. Goals include: awareness raising, site stabilisation where possible, estimating the costs of rebuilding, and prioritising future reconstruction, amongst others. However, these efforts are relatively new, and there is no agreement on the most effective ways to record damage, as, given the ongoing situations, there has been no time to review the various methods used. A large number of organisations have created databases to record the damage, ranging from simple Microsoft Excel or website lists, to adaptations of market-based products (e.g. Microsoft Access), to custom-built modular designs. This presentation will give an overview of the principles underlying damage recording, and review some of the databases created for this purpose, remembering their different goals, with the aim of drawing out a set of suggestions for best practice.

Case Studies:

Remote Sensing Work in Palmyra/Syria

Andreas Schmidt-Colinet, Universities of Vienna and Munich

The existence of a Pre-Roman/Hellenistic settlement of Palmyra is attested by literary sources. But, location and history of this early settlement was completely unknown until now. By several reasons the location of this settlement was supposed in an area outside the later roman city, south of the wadi. It is covered completely by sand, and no over the ground building remains can be recognized there. Base on this evidence, in 1997 and 1998 a geophysical prospection of this area was carried out combined with a digital groundmodelling based on photogrammetry. An area about 2 ha was prospected by Caesium-Magnetometry. A smaller area of about 100 m² was measured also by Electric-Resistivity. Result: Without any excavation, complecity plan can be recognized with street systems and adjacent buildings of different density under the sand. Based on the magnetogramm, several small stratigraphical excavations proved the relative and absolute chronology of these structures down to the 3rd century BC. Thus, the location, existence and part of the urban structure of ancient Palmyra was proved. Another consequence of this research is, that the whole area can be protected as antiquities zone by the Syrian authorities.

Satellite Images, GIS, Fieldwork and 3D Modeling of Landscapes in Studying Nomadism in Central Syria

Minna Silver, CIPA, Mardin Artuklu University

The Finnish archaeological survey and mapping project SYGIS worked under the present author in the mountainous region of Jebel Bishri in Syria in 2000-2010 using remote-sensing methods, GIS, fieldwork and 3D landscape modelling. The aim was to document and study a vulnerable spatial boundary zone between the Syrian Desert and agricultural and irrigated fields of the Euphrates river and how the cultures have been affected by those environments. The project was an early initiative to use GIS in Syria and included providing GIS course to the members of the Syrian Antiquities Authority.

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In the 1990s new methods had been developed to study the archaeological remains of the nomads, which the project was able to apply and benefit afresh. Satellite imagery was used in studying environmental changes and prospecting ancient sites that were checked and documented in situ. Such as Landsat and QuickBird images were used with X-SAR data and ASTER-DEM to model the landscapes. The project highlights the importance to document and preserve mobile cultures, such as those of hunter-gatherers and pastoral nomads. Bedouins are part of the Syrian culture and they are the followers of past pastoral nomads in the region.

The Application of Terrestrial LiDAR Technology to the Study of Early Urban Sites in the Near East: Tel es-Safi/Gath, Israel

Deland Wing, University of Manitoba / Haskel J. Greenfield, University of Manitoba / Aren M. Maeir, Bar-Ilan University

In recent years, LiDAR technology has been systematically applied to the study of archaeological sites and/or monuments largely as part of the study of landscape topography (including view sheds, architectural relationships, etc.). Rarely it is used as an analytical tool to record dimensions and stratigraphic relationships. LiDAR technology can capture millions of data points in a brief span of time allowing for more subtle imagery and analysis than in more popular data collection techniques. LiDAR technology also allows for disparate excavation areas to be integrated into a single analytical unit. Data from the archaeological site of Tell es-Safi/Gath, Israel, will be used to demonstrate the some of the advantages of this kind of approach to data collection and analysis.

3D Technology within Digital Humanities: Analyzing Cuneiform Script with GigaMesh

Hubert Mara, FCGL – Forensic Computational Geometry Laboratory, IWR – Interdisciplinary Center for Scientific Computing Heidelberg University

Motivated by the demands of the Digital Humanities we are developing methods to extract characters and other human traces from tangible objects. Thanks to the increased availability of 3D measurement technology within the archaeological domain text sources like cuneiform tablets become more and more available as high-resolution 3D data sets. Therefore we propose a Multi-Scale Integral Invariant filtering approach implemented within our GigaMesh software framework. This allows for improved visualizations and extraction of script – and other man-made feature – in 3D. Therefore 3D meshes are reduced to a minimal graphical representation and exported as Scalable Vector Graphics (SVGs). These automated SVG drawings are – identical to their manually drawn counterparts – highly suitable for further tasks like word spotting and other application of machine learning approaches. We will present examples from our projects within Assyriology and how these methods can be transferred to other domains like Epigraphy.

Documentation of Some Cultural Heritage Emergencies in Syria in August 2010

Gabriele Fangi, CIPA, University of Ancona / Wissam Wahbeh

All six Syrian World Heritage properties were inscribed on the List of World Heritage in Danger, at the 37th session of the World Heritage Committee, held in Cambodia in June 2014: Ancient City of Aleppo, Ancient City of Bosra, Ancient City of Damascus, Ancient Villages of Northern Syria, Krak des Chevaliers

and Qal'at Salah El-Din and finally the Site of Palmyra. See the following links: https://www.youtube.com/watch?feature=player_embedded&v=kr.a3e0DL5sA and <https://www.youtube.com/watch?v=ltFFjirUgtU>. Apart the Ancient Villages of Northern Syria, the A. visited all the World Heritage sites and partly documented. In 2010, just before the war, the A. made a touristic trip together with Crua (Recreational Club of the Ancona University). It was the occasion to make some fast documentation of some Syrian CH monuments. Mostly of the images were taken by the A. not to make a survey, but as a photographic report, as fast and complete as possible. Syria is a country of many civilizations, Amorite, Aramaic, Phoenician, Roman, Byzantine, Islamic and Ottoman civilizations. Therefore it is full of cultural heritage remains. Unfortunately many of them have been destroyed by the war, beyond the thousand civilian people killed. But, the photographs taken in such a touristic way, have been used to try to get some usable plotting restitutions, and it worked successfully most of the times. These surveys could be useful in case of reconstruction and in case of lack of suitable alternative metric documentation. We built up a data-base of the available material.

Saving the Heritage of Aleppo in Syria: Case Studies Based on Photogrammetry Archives of the Citadel and the Great Omayyad Mosque

Pierre Grussenmeyer, CIPA, INSA - L'institut national des sciences appliquées de Strasbourg

The paper will present photogrammetry archives, recorded and collected by the author between 1999 and 2002 in partnership with the Engineering Unit of the University of Aleppo. Several terrestrial and aerial archive images of the Aleppo citadel and the Great Omayyad mosque with its well-known minaret have been used at that time for documentation purposes and geotechnical studies. The citadel and the Mosque have unfortunately been seriously damaged during the recent conflict. The paper will present a summary of the documentation available from the past projects as well as solutions of 3D reconstruction based on the processing of the photogrammetry archives with the latest 3D image based techniques.

Documenting Syrian Built Heritage to Increase the Awareness in the Public Conscience

Grazia Tucci / Valentina Bonora, University of Florence

The Laboratory of Geomatics for the environment and the conservation of cultural heritage has been involved in the past in two projects that led us to work in Syria. Both of them were funded by the European Union:

- COUPOLES ET HABITATS. Une tradition constructive entre Orient et Occident, in 2007,
- MARE NOSTRUM. A heritage trail along the Phoenician maritime routes and historic port-cities of the Mediterranean Sea, in 2009.

As Geomatics, we contributed collecting spatial data and preparing graphical elaborations aimed to document, in a multi-scale approach, constructive details, buildings, parts of cities that today are probably severely damaged, if they still exist.

In the projects a different approach was followed:

- in the first one, a top-down approach: the core goal of the project was the analysis of the constructional system of earthen buildings in villages in the north of the Syria, that was carried out by an interdisciplinary and international team of experts

- in the second one, a bottom-up approach: Mare Nostrum project was aimed at providing a sustainable mechanism for the protection and management of cultural heritage resources leading to an awareness of cultural heritage in the public conscience. Beside the technical experts team, local public authorities, guides and tour operators, teachers and students were involved, with the aim to enhance the public interest and pride for their own cultural identity.

Damage Assessment/Reconstruction Strategies and Final Discussions:

The Destruction of Syria's Cultural Heritage: a Mapping of Current Challenges and the Prospects for Post-conflict Reconstruction

Nibal Muhesen, Copenhagen University

The cultural heritages in Syria, along with its archaeological sites, as well as its museum collections, constitute a unique richness to Syria and the world global heritage as a whole. Syria's heritage is threatened by the on-going armed conflict, especially due to increasing number of destructive actions committed by extremist groups. Taking as its starting point the strategic importance of Syria's heritage locally and globally, and the various aspects of the on-going destruction, this paper will develop/explore questions related to the post-conflict phase, such as the harm inflicted on the collective memory and identity, and the importance of international and national law in post-conflict reconstruction policy.

The Old City of Aleppo: Destruction Overview and Rebuilding Strategy

Cheikhmous Ali / Philippe Quenet, APSA - The Association for the Protection of Syrian Archaeology

Beyond satellite imagery, detailed information can only be retrieved thanks to voluntary people on the ground. Using this invaluable and unique documentation about the destruction of the Syrian heritage enables to draw a general picture of the situation in Aleppo, especially in the Old City. There, the Umayyad Mosque and the Citadel are subjects of concern – even more the surrounding neighborhoods which to date, have had domestic, public and economical functions. For those, rebuilding plans are urgently needed.

Syria: Actions, Reactions, and the International Perspective

Emma Cunliffe, EAMENA - Endangered Archaeology in the Middle East & North Africa, University of Oxford

As the Syrian conflict enters its fifth year, the international community is seeking to assist the Syrian people to protect their heritage. However, such work is facing numerous difficulties, beyond the obvious problems of working in a conflict situation, leading to duplication of effort, and projects that are disconnected from the broader picture. As Da'ish have extended the conflict into Iraq, and extremist destruction is recorded across the MENA region, it is vital that the international community tackles these issues and seeks ways forward, in order to ensure that the limited funding available is spent effectively, achieving the maximum aid. This paper will review the work so far and consider the issues faced, suggesting ways all parties can act more effectively now and in the future, and highlighting key connections that may not have been considered.