



Final report of the activities

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Final Report of the Activities

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EuroTech Outputs

The EuroTech project foresaw a number of intellectual outputs:

- **O1 - Development courses/curriculum.**
- **O2 - Diagnostic of the Risk.**
- **O3 - Remote sensing and integrated GIS for territorial analysis.**
- **O4 - Archaeometry and 3D reconstructions in the study and monitoring of monuments.**
- **O5 - Methodology of archaeological field research.**
- **O6 - Valorization of Cultural Heritage.**
- **O7 - Management and valorization of data, archives and databases for scientific research.**
- **O8 - E-learning platform.**

The Cyprus Institute participated in several activities organised by the partners and carried out some of them, contributing to the achievement of the project's intellectual objectives. Within the report and the list of the activities carried out, the contribution provided by the Cyprus Institute to the achievement of the project outputs has been highlighted.

This report covers the activities carried out from month 1 to month 40 of the project (1st November 2018 – 31st December 2021).

1. Development of courses/curricula

Digital technologies provide the new fundamental basis for education. Indeed, they can support the learning process. On the one hand, digital technologies play a key role in allowing innovation proving the framework for objective scientific evaluations while also facilitating co-creation and solutions that engage students in the learning process in Cultural Heritage and Archaeology studies.

The activities carried out within the project envisages a holistic approach, which encompasses interdisciplinary contributions, and where 3D technologies help link to relevant information and enrich data. By exploiting advanced digital technology within the teaching and learning process, will support research while improving the skills of the human capital: the students of today and professionals of tomorrow.

○ 1.1. MSc organized within EuroTeCH



Figure 1. Poster of the new MSc established at the Cyprus Institute.

Within the frame of the EuroTech project and the intellectual output of developing new educational courses and curricula, a new MSc course has been established at the Cyprus Institute.

The first course started in September 2020. From the establishment of the new course, six (6) students enrolled in the program in its first year of activity and seven (7) in the second batch. We aim at reaching a maximum number of ten students to be enrolled in each academic year.

All six students from the first year of the Master of Science graduated successfully in 2021, corresponding to the end of the EuroTech project (31st December 2021). Following, the abstracts of the new Cyprus Institute graduated Master of Science in Digital Cultural Heritage.

“CODIFYING AN ARTIST'S STUDIO: AN ONTOLOGICAL APPROACH FOR THE DOCUMENTATION AND ANALYSIS OF ARTISTIC SPACE AND PROCESS” - Andriana Nikolaidou

Abstract

The studio of an artist has always been considered a suitable shelter for the individual's art-making journey. An artist's studio hosts many self-referential elements providing insights into the artist's work, philosophy, influences, and thinking process. Studying these work sites as material artefacts identifies the artist's studio as an essential instrument for creative performance. This thesis proposes a documentation framework based on ontological approaches that capture the essence of the artist's creativity in the studio. The primary aim of the framework is to capture a wide range of elements in the studio connected with the urban and social environment of the artist using interactive digital documentation methods. The interactive survey of the studio's physical space is based on a 360° panoramic documentation and a video interview of the artist to reveal insights about the relationship between the artist and his workspace. Essential concepts for studying an artist's studio are encoded and modelled using the CIDOC-Conceptual Reference Model and Art & Architecture Thesaurus structured vocabulary. This will assure the common management, presentation and promotion of these rich art resources within the broader cultural scene.

“AN ONTOLOGICAL APPROACH TO THE EXAMINATION OF THE CULT OF SAINTS RELATED WITH CYPRUS” - Christina Kakkoura

Abstract

The present thesis attempts to approach the complex and multidisciplinary subject of the examination of the cult of saints connected with the island of Cyprus, with the application of an ontological approach. The most important concepts involved in the study of the cult of saints are identified. The thesis proposes the use of the CIDOC Conceptual Reference Model as the tool allowing the semantic description of concepts and relationships of data from multiple sources addressing the matter of the cult of saints in Cyprus and the creation of an ontology. The creation of the ontology intends to provide a shared ground for the understanding of the topic, closely connected with most aspects of cultural heritage in Cyprus, and to facilitate the examination of the volume of evidence involved, deriving from many scientific fields. In order for the documentation of the relevant data to be gathered, be semantically described and be harmonized in the form of an ontology so that they could be used in studies of cultural heritage, some basic concepts and terms are explained, and the theoretical background of the matter is provided. The ontological representation of the cult with the use of CIDOC CRM and the analysis of the classes and properties is given with the use of two specific examples, while in a separate subchapter the use of the CRMtex extension is employed, in an effort to showcase the complexity of the topic under examination, the possibilities of the use of various ontological models, and the necessity for the development of ontologies, allowing integration of data from several fields.

“REVISITING THE ARCHITECTURAL HISTORY OF THE GREAT CATHEDRAL OF ALEPPO (AL- MADRASSA AL-HALAWIYYA) AN HBIM APPROACH” - Rahaf Orabi

Abstract

The church of Saint Helen was one of the prominent buildings in Aleppo, during the Byzantine period. Almost 500 years after the Muslim conquest of Aleppo, the church was converted to a theological school in 1124. Yet, architectural elements from the Byzantine period remained an integral part of the madrasa.

This study offers a historical, geographical context, literature review starting from Medieval accounts to the work of 20th century orientalists. Then draws on the big picture of political, religious, social atmospheres: mainly to position al- Madrasa al-Halawiyya in the local and regional context. It sheds light on the relationship between the religious patronage and assertion of power and social influence especially for leaders who come from different ethnic backgrounds than the local population.

It also explores the historical and architectural development of al- Madrasa al-Halawiyya and examines the reconstruction theories about the style of the Byzantine church that was incorporated into the madrasa. It also provides architectural analysis of the surviving structure, its historical development, and analyzes the main two architectural reconstruction theories proposed by Guyer and Ecochard about the form and typology of the Byzantine church. It investigates both theories in search of the form and layout of the church during the Byzantine period.

The study utilizes a hybrid point cloud to create a virtual reconstruction of the Cathedral during the Byzantine period. The point cloud analysis enables the identification of different historical periods of al- Madrasa al- Halawiyya in terms of architectural development, in addition to providing a wide range of information (regarding the structural stability, degree of war- damage and weathering and environmental effects on the building) when needed. But more importantly, it holds a possibility to identify the possible layout and form of the cathedral by creating HBIM models of each suggested plan and comparing the result to the point cloud of the survey. Eventually, this work will provide a digital-analog workflow to utilize point cloud data as a key element in identifying the architectural development of a building structure during its various historical phases.

“AGIOS SOZOMENOS: A SITE OF PLURALITY” - Aliosha Bielenberg

Abstract

This thesis focuses on the site of Agios Sozomenos, an abandoned village near Nicosia, Cyprus, with a multi-layered past and complexly resonating present. The presentation of the site follows historical, archaeological, and anthropological lines. Information is presented on Bronze Age remains near the site; the medieval cave chapel and unfinished Latin church; and the subsequent evolution of the community as a mixed village under Ottoman and later British rule. This historical work both summarizes previous literature and includes original research based on archival sources and ethnographic fieldwork. This work provides the background for an intervention adopting methodologies from digital cultural heritage. In particular, the thesis discusses the creation of a public-facing website, including interactive elements and hybrid physical components, which supports efforts for engaging the plurality of visitors to the site around the many facets of the site’s cultural heritage. The thesis

concludes with a discussion of this work and this site in relation to broader theoretical discussions in anthropology and political theory, focusing especially on the themes of plurality and objectivity.

“A HERITAGE – BIM APPROACH TO THE CYPRIOT VERNACULAR ARCHITECTURE” - Phivos Poullos

Abstract

This Master Thesis focuses on the implementation of Building Information Modelling (BIM) to the Cypriot vernacular architecture. As an example, a case study dwelling was selected for the generation of a Heritage-BIM model. In addition, a parametric family was created of a traditional window. This family can be shared, modified by preference and be reused to HBIM models of other vernacular dwellings. All the challenges and benefits of BIM are explained in detail. The focus of this Master Thesis is on how digital technologies (HBIM) can be beneficial to cultural heritage and more specifically to vernacular architecture, as Cypriot vernacular architecture is unique.

“CULTURAL HERITAGE TOURISM FOR POST-CONFLICT RECOVERY IN DAMASCUS-SYRIA: CAN SMARTPHONE APPLICATIONS HELP?” - Tareq Aljabban

Abstract

As societies suffer mostly socially and economically in post-conflict countries, tourism can play an important role in improving the socio-economic situation by generating jobs, accelerating economic growth and increasing foreign exchange. Yet, in conflict-affected countries promoting tourism is not an easy task. However, with the fast advancement of technology, digital applications have been integrated in cultural heritage, which led to the development of heritage studies and heritage interpretation. Digital tools can help in developing tourism in post-conflict countries. In this case, a smartphone application can be the key to provide personalized tours for visitors that allows them to customize the tour per user's choice. The application could also provide different themes, locations and sets of information that are tailored to the user's preference. By providing a different narrative, a narrative that communicate and engage the local community by sharing their stories and history, it would benefit both community members and tourists. Listening to the local narrative can provide tourists with a new perspective and at the same time help the community socially and financially. While tourism help improving the economy, communicating stories about heritage, history and conflict serves as a peace building tool. This research addresses the issues of cultural heritage, conflict, tourism in post-conflict recovery, and proposes a smartphone application design that has been developed and tested in the context of the case of Damascus city in Syria as a post-conflict destination.

○ 1.2 PhD partly developed within EuroTeCH

The PhD program in Science and Technology in Archaeology and Cultural Heritage was already established at the Cyprus Institute in 2011. Nevertheless, thanks to the intellectual

and scientific support of the EuroTech project, during the period 2008-2021 some of the already-enrolled and newly matriculated PhD students had the possibility to develop parts of their doctoral thesis. Such a development was possible thanks to participating in classes provided by experts involved in the project and in specific courses offered by the project's partners (e.g., GIS course). Moreover, the technical and digital expertise of the people involved in EuroTech and the facilities of the partners' laboratories allowed the students to carry out parts of their work.

Following, the abstract of the thesis that in different ways benefited from the EuroTech project.

“Cultural & Digital Topographies of Alexandria. Transition and Transformation from Paganism to Christianity” - Athanasios Koutoupas

Abstract

The advent of Christianity was a powerful source of political, economic, religious, and social change in the Mediterranean world. Developments in the city of Alexandria are amongst the most iconic examples of the complex transition between paganism and Christianity in late Antiquity. However, for all its significance, the physical traces of the evolution of Alexandria's urban landscape are limited and lack a synthetic spatial consideration. Although literary sources from the period describe an active city that functions as the regional epicenter of the expansion of the new religion (i.e. Christianity), the archaeological realities on the ground remain scarce. As a result, the modern researcher struggles to identify the city's late Roman and early Byzantine topography and organization.

The proposed PhD thesis aims to outline the problems of current research and to utilize new approaches and digital technologies to map Alexandria's Late Roman/Byzantine period in an effort to revisit its transition from paganism to Christianity in Alexandria through the lens of the city's Greco-Roman past and the dynamics of its socio-religious groups. Research work will draw from literary sources and material evidence to re-interpret the topography of the city and its spatial experience. For this purpose, a variety of digital tools will be used, such as 3D visualization methods to document the available material on the ground towards the creation of a digital repository that can facilitate data interpretation, visual analysis and dissemination of knowledge. Furthermore, by using GIS technologies, the thesis aims to understand the chronological layers of the city's transition from a metropolis of the Hellenistic and Roman Mediterranean to a center of Christianity.

“3D approaches to Cypro-Minoan writing” - Martina Polig

Abstract

Cypro-Minoan writing is an undeciphered syllabic Bronze-Age script from Cyprus. There are still many open questions regarding this writing system that concern even basic elements such as the number and shape of signs constituting the script and the underlying language. These gaps in research are in part due to the small size of the corpus that comprises only 251 inscriptions, but a large part can be explained by the challenges posed in the study material available to researchers. These challenges are related to the absence of a catalogue of signs, an essential tool for palaeographic groundwork, and intrinsic problems and limitations of traditional documentation of inscriptions. They not only consist in the

difficulty of creating an adequate 2D documentation (lighting and positioning, magnification and surface texture) but also the impossibility to capture geometric properties such as depth and angle associated with the reduction of an inherently 3D element to 2D and the subsequent loss of information. Consequently, signs are only described through descriptive and subjective means which makes an objective comparison challenging, an already difficult task due to the amount of data that needs to be evaluated with sign numbers being in the thousands. This paper discusses how through 3D approaches the problems in the base study material of Cypro-Minoan research are addressed by providing a high resolution 3D documentation and a digital sign repository where each sign is characterised objectively and with its geometric properties. This will enable for the first time an objective evaluation and discussion of the shape and number of signs in the Cypro-Minoan signary as well as potentially highlight temporal and regional differences in sign rendition. In doing so new challenges in 3D approaches to palaeographic research are being introduced and explored that relate to the analysis of sign shape across different supports and materials.

“Technological complexity and subsistence economy at the Upper Palaeolithic site of Bilancino, Italy. A multiproxy investigation of ground stone tools and residue analysis.” - Silvia Florindi

Abstract

Macro-lithic tools, such as grinding tools, are among the most relevant artefacts to reconstruct the raw materials management/exploitation strategy and the social organisation of past human communities. Moreover, functional study, combining different research techniques, provides data related to past life activities, which are difficult to detect in the archaeological record, such as the production of vegetal based food and other activities related to perishable materials.

The aim of the present work is to use residue analysis, experimental archaeology, traceology, digital techniques and scientific visualisation, to understand the function and the use of Palaeolithic macro-lithic tools mostly used to process raw materials. A validated methodology will be created and tested to capture, annotate, and describe traces and functional areas on these artefacts. The set of tools object of the analysis come from the Gravettian camp site of Bilancino (Tuscany, Italy) and from several experimental studies. The expected outcome will be a high-resolution 3D model for each artefact, integrated on an interactive visualisation platform (3DHOP) interrogating all the morphometric data and the results of residue analysis, showing the exact position of the traces and the functional areas on the artefacts. Hence, it will be possible to obtain crucial data to reconstruct the technological aspects related to the exploitation of vegetal, animal and/or mineral raw materials. This still ongoing project has greatly benefited from the outstanding offer of digital techniques for cultural heritage given by the Cyprus Institute. Thanks to the support of the professors, the researchers, the technicians and other colleagues enrolled in the PhD program, I had the opportunity to improve my project with innovative and up-to-date methods to document, describe and analyse my set of materials. The courses offered in the PhD program also helped me to focus on advanced methodologies helpful for my research.

‘A 3D Digital Approach to the Stylistic and Typo-Technological Study of Small Terracotta Figurines from Ayia Irini, Cyprus’ - Valentina Vassallo

Abstract

The main aim of this research is to contribute to the analysis of archaeological artefacts, through the development and use of a 3D digital approach. The proposed method is applied to the study of a sample of clay figurines found at the site of Ayia Irini (Cyprus). This thesis attempts to contribute to the study of the mentioned archaeological material by means of 3D digital technologies. Moreover, the application of quantitative analysis to the case study will possibly add new elements to the study of the small coroplastic production within the wider archaeological context of Cyprus. Specifically, the research aims at i) proposing a new approach, based on the integration of 3D shape and surface analysis with semantic descriptions of terracotta figurines and their attributes, and ii) understanding the function and social role of the sanctuary as reflected by the stylistic and typo-technological analysis of terracotta figurines. The work is organized in order to achieve several objectives: i) the development of a 3D digital approach based on methods and techniques able to generate three-dimensional digital models that represent the geometry, shape and texture of the real objects (technological method) in order to study the production of the material; ii) extraction of measurable elements and features for geometrical and topological analysis and comparison aimed at identifying the existence of standards and production patterns; iii) identification of production patterns through materials properties analysis; iv) semantic description of the geometric parts and decorative features that compose the shape of a statuette. Finally, v) the digital reconstruction of the archaeological context and the assemblage re-contextualization to contribute to the interpretation of the sanctuary.

“The Digital Transformation in Cultural Heritage” - Luciarita Nunziata

Abstract

The phenomenon of digital transformation has become very popular in recent years and the exploitation of digital technologies has substantially transformed society bringing fundamental changes and offering new opportunities in several fields. The digital revolution has also reshaped the domain of cultural heritage, which holds the power of enriching societies and shaping their values. However, there is a need to go more in-depth, analyze these changes and depict this new complex context of cultural heritage, whose research literature is scarce and a digital transformation model still missing. In fact, cultural institutions and heritage sites are facing two big challenges to survive: the increased need for a digital strategy and how to identify ways of reinforcing common action for the benefit of the society, where museums and cultural places play a key role. This research bases on the analysis of different case studies aims to identify a digital transformation model in the cultural heritage domain by assessing and integrating recent needs in the heritage methodology and practice, and by questioning the transformation of the value and identity of cultural heritage in this process. While the digital transformation business model focuses on 3 key concepts (customer, product, and processes), there are different layers of applications in cultural heritage, as technology offers new possibilities for creating new spaces, new forms, conceptions, and uses of heritage. Thus, analyzing different realities, through a critical comparison and considering local, regional, and global factors, stakeholders and availability of these realities, this research will construct a framework applicable in other realities and propose a perspective in cultural heritage studies that consider, together, the new social and technology landscape in the digital transformation process of Cultural Heritage.



This research topic covers several aspects of digital heritage well-aligned with current research expertise at the Cyprus Institute. Although at its initial research phase, it has largely benefited from the ongoing scientific activities, professionals and classes at the Cyprus Institute.

2. Events, webinars, conferences, meetings organized by the partner

○ 2.1 Events

- EuroTech Roundtable “Looting and Illicit Trafficking of Antiquities” (December 2021)



Figure 2. Roundtable “Looting and Illicit Trafficking of Antiquities”.

On the 9th of December 2021, the Cyprus Institute hosted a roundtable working meeting on the broader topic of “Looting and Illicit Trafficking of Antiquities”, with the participation of Police representatives from various countries. This workshop was organized by the Cyprus National Committee for Combating Looting and Illicit Trafficking of Cultural Heritage, in collaboration with the Cyprus Department of Antiquities, the Cyprus Police, The Cyprus Institute, the Italian Embassy in Nicosia and the University G. d’ Annunzio of Chieti-Pescara with support from the European Project EuroTeCH.

The workshop focused on key issues of protocols and best practices against the devastating practices of looting and illicit trade as well as circulation of antiquities, and other cultural heritage assets. Moreover, participants had the opportunity to address an array of challenges, such as the growing use of advanced technology and the web by looters and traffickers, the impact of economic, conflict and climate related migration, the role of organized crime which responds to the ever-growing market for illegal antiquities, the related legal complexities, and the necessity for better coordination and appropriate sharing of data. Furthermore, the meeting explored possible venues for collaboration and synergies within the European Union, but also at the regional and international levels, against the rapidly emerging threats of looting and trafficking of our precious cultural heritage.

Additionally, the partners who participated in the roundtable had the chance to highlight the collaborative work that was done so far between them.

On the same day, the EuroTech partners and the stakeholders invited to the roundtable had the possibility to participate in the signing ceremony of the renewal of Memorandum of Understanding (MoU) between the Cyprus Institute, the Cyprus Police and the Department of Antiquities of Cyprus agreeing to reinforce their collaboration on issues of common interest, related to the use of digital technologies (aerial and terrestrial) for the protection of archaeological monuments and sites affected by looters. Under the aegis of this agreement future collaborations among the EuroTech partners will be facilitated.

- EuroTech Event ‘EuroTech in Cyprus: Technologies, Sites and Museums’ organised in Cyprus (October 2021).



Figure 3. Poster of the event ‘EuroTech in Cyprus: Technologies, Sites and Museums’

During the event, several activities have been carried out, such as visits at the ancient sites of Amathus and Kourion and at the Limassol Museum, and at the archaeological sites of Paphos.

The last day was organised at the Cyprus Institute. On that occasion, the visitors attended the following presentations given by the Institute researchers:

- Presentation on how technology help in the study of graffiti, considered as a marker of social interaction and mobility in Cypriot churches
- Presentation of the use of digital technologies for the study of coroplastic assemblages.
- Presentation on the use of analytical investigation for the study of archaeological artefacts from several Cypriot sites.

Moreover, the visitors had the opportunity to attend interactive presentations in one of the laboratories dedicated to the Virtual Reality of the STARC.

The EuroTech partners were also invited to the residency of the Ambassador of Italy in Cyprus for celebrating the 50 years of bilateral relations between Italy and Cyprus in the field of Cultural Heritage. On that occasion, the Ambassador congratulated the EuroTech project and announced the release of a documentary series in which two partners of the project, the University of Chieti and the Cyprus Institute, have been protagonists as important contributors to the archaeological and cultural research in Cyprus.



Figure 4. Presentations and interactive visits at the Cyprus Institute

- The Eurotech project has been presented in the following events in which the Cyprus Institute participated:
 - Researcher’s Night 2019, 27th of September at Philoksenia center, Nicosia, displaying the activities developed within EUROTECH and other Cyl-STARC projects.
 - Lecture Series of the Department of Byzantine and Modern Greek Studies – Department of History and Archaeology – University of Cyprus. Title: Cypriot graffiti, an overview (25th September 2019).
 - Official visit of the delegation of the Israeli Department of Antiquities. Title: The graffiti of Cyprus, functions and meanings (26th March 2019).
 - Italian Research Day in the world 2019, Presentation titled: Revealing the unseen: the hidden heritage of San Marco graffiti in Venice (16th April 2019)

○ **2.2 Webinars**

- Online Seminar (14th December 2020)

Under the EuroTech project, an online seminar titled “Advancing Research in Archaeology through Science and Technology” was given by STARC Associate Professor Sorin Hermon at the Second "Oristano Aegean Seminar". The Oristano Aegean Seminars are organised by the Centro Internazionale per la Ricerca sulle Civiltà Egee (C.I.R.C.E.). The Center was born from the collaboration between the University of Sassari, the Municipality of Oristano and the UNO Consortium (School of Specialization in Archaeology of the University of Sassari). The video of the online seminar can be found here: <https://www.youtube.com/watch?v=bgTRIMdZQ4Y>



Figure 5. Poster of the seminar “Advancing Research in Archaeology through Science and Technology”

- Online public lecture (25th March 2021)

Under the framework of the EuroTech project and its Archaeo Webinar series, an online public lecture was given by STARC - Science and Technology in Archaeology and Culture Research Center Associate Professor Sorin Hermon. The lecture topic was "Advancing Archaeological Documentation and Research through Science and Technology at Pyla-

Kokkinokremos, a Late Bronze Age site in Cyprus". The webinar has been live-streamed via Zoom (<https://zoom.us/j/7JUuce2urDstGNE05kuHFGzBPiJmGuhymEZ3>)

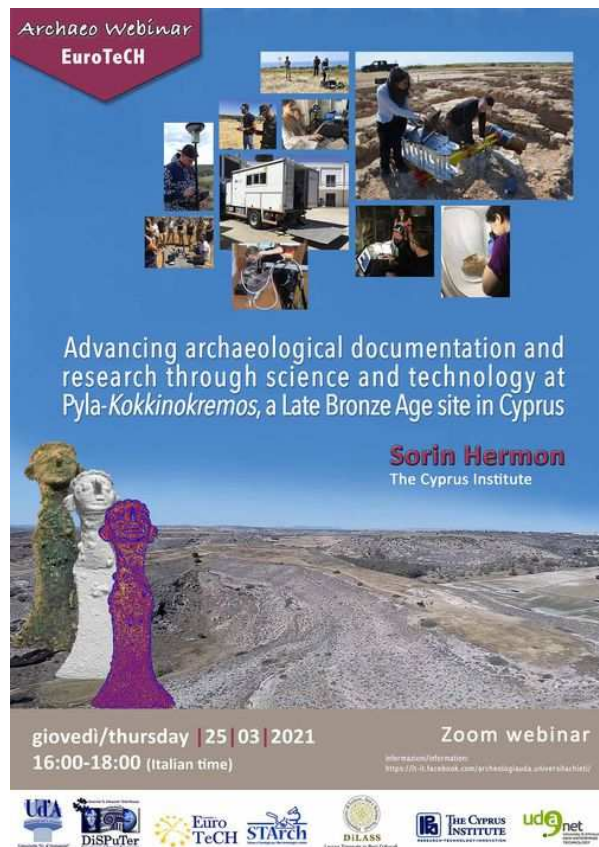


Figure 6. Poster of the web conference "Advancing Archaeological Documentation and Research Through Science and Technology at Pyla-Kokkinokremos, a Late Bronze Age site in Cyprus"

o 2.3 Conferences

- A PhD candidate of the Cyprus Institute participated in the one-day online conference organised by the senior students of EuroTech of the University of Warsaw "IX Inter-University Academic Conference "Roma, Romae, Romae ..." with a contribution titled: 'Digital analysis of Roman building complexes. The case study of the House of Tofelanus Valens (V 1,28) in Pompei'.

The conference focused on the tangible and intangible cultural heritage of the Romans. Issues of its understanding, reception, preservation and popularization were addressed. During this meeting, the voice belonged mainly to students as people just starting their careers. Due to the covid-19 pandemic, the conference was organized online.

ROMA, ROMAE, ROMAE...



IX INTER-UNIVERSITY ACADEMIC CONFERENCE IX MIĘDZYUCZELNIANA KONFERENCJA NAUKOWA

Studenckie Koło Naukowe Numizmatyki i Archeologii Rzymu przy Wydziale Archeologii Uniwersytetu Warszawskiego ma przyjemność zaprosić wszystkie zainteresowane osoby, szczególnie studentów i doktorantów, do udziału w IX Międzyuczelnianej Konferencji Naukowej „Roma, Romae, Romae...”, która odbędzie się 5 czerwca 2021 r. na platformie internetowej Zoom.

Zachęcamy do wygłoszenia krótkiego referatu (15 minut), dotyczącego zagadnień związanych z archeologią, historią, sztuką, epigrafiką lub numizmatyką starożytnego Rzymu. Podobnie jak w ubiegłych latach, konferencja będzie miała interdyscyplinarny charakter. Zależy nam na podjęciu ciekawej, wielowymiarowej dyskusji na temat kultury starożytnego Rzymu.

Poprzez różnorodność podjęmowanych zagadnień pragniemy pokazać niezwykle bogactwo świata rzymskiego, który stał się fundamentem współczesnej cywilizacji europejskiej.

Aby wziąć udział w Konferencji wystarczy wypełnić formularz zgłoszeniowy najpóźniej do 24 maja 2021.

The Students Scientific Club of Numismatics and Archaeology of Rome at the Faculty of Archaeology of the University of Warsaw is pleased to invite all interested people, especially students and doctoral students, to participate in the IX Inter-University Academic Conference “Roma, Romae, Romae...” which will be held on June 5, 2021 on the Zoom online platform.

We encourage you to deliver a short lecture (15 minutes) on issues related to archaeology, history, art, epigraphy, or numismatics of ancient Rome. As in previous years, the conference will be of an interdisciplinary nature. We want to start an interesting, multidimensional discussion on the culture of ancient Rome.

Through the variety of issues raised, we want to show the extraordinary richness of the Roman world, which has become the foundation of modern European civilization.

To participate in the Conference, it is enough to fill in the application form no later by May 24, 2021.



Figure 7. Poster of the “IX Inter-University Academic Conference “Roma, Romae, Romae ...”

“Digital analysis of Roman building complexes. The case study of the House of Tofelanus Valens (V 1,28) in Pompei” - Vassallo Valentina, The Cyprus Institute/Lund University.

Abstract

The investigation of ancient architectures allows to understand their original morphology, their function, and their history, and to elaborate interpretative hypotheses and reconstructions that are based on several factors, such as the constructive and static logic, the study of materials, the cultural background, the historical parallelisms, and the study of the sources (Moro et al. 2007). The use of digital technologies (e.g., laser scanner, photogrammetry, image-based modelling) aim at the survey of these complex structures and their geometric documentation. Furthermore, digital data acquisition allows obtaining 3D models representing those structures with a margin of error of a few millimetres. Beyond their documentation and preservation, they can be used for several scopes, such as the possibility to support their study, analysis, and interpretation. This paper results from an experiment to analyse complex built environments with the support of new technologies within the Building Archaeology subject. Particularly, the analysis of complex built environments through digital models is applied to the case study of the House of Tofelanus Valens (V 1,28) in Pompei. The building complex is part of the insula V, 1, it was excavated for the first time in 1875, and is currently under investigation and study by the University of Lund.”

- Two researchers participated in the EuroTech International conference 'Behind the Buffer Zones: Archaeology at risk and illicit traffic of antiquity' with a contribution titled 'Virtual access to inaccessible heritage: the case of churches in Turkish military controlled areas of the Northern part of Cyprus - 3D documentation and restoration of frescoes and mosaics' (Hermon S. & Abate D.)



Figure 8. Poster of the International conference Behind the Buffer Zones and the auditorium.

○ 2.4 Meetings

- The Cyprus Institute participated in the EuroTech kick-off meeting held at the University G. d'Annunzio Chieti-Pescara on 26th-27th November 2018, with a contribution titled: "Laboratories and Projects in the field of Cultural Heritage of the Cyprus Institute" by Hermon S. and Abate D.)

Chieti, 26-27 novembre 2018

Università degli Studi "G. d'Annunzio" di Chieti-Pescara

Lunedì 26 novembre 2018		Martedì 27 novembre 2018	
Aula Multimediale del Rettorato - Campus universitario di Chieti		Aula Multimediale del Rettorato - Campus universitario di Chieti	
Ore 15:00 Opening of meeting		Ore 17:40 R. CARROZZA, G. ALOZZI (Pegaso srl) La società Pegaso srl ed i suoi progetti di Imaging multispettrale	
Ore 15:15 O. MINOZZI (University "G. d'Annunzio" di Chieti-Pescara - CAAM) Presentation of the Research Unit, of the Institution in EuroTeCH project.		Ore 18:00 J. RUIZ DE ANSUÑO, R. MUE (University Rovira i Virgili, Tarragona, Spain) Presentazione del gruppo di ricerca SETOPANT (www.setopant.com) e nel complesso i nostri studi di Grado, Master e Dottorato in Archeologia Classica presso l'URV (www.urv.cat) in collaborazione con l'Istituto Catalano di Archeologia Classica (www.icaac.cat)	
O. MINOZZI, M.C. SOMMA, S. ANTONELLI, V. LA SKOVA, M.C. MANCINI, E. DI VALERIO, M. MONTESANO, P. STAFFILANI, V. TORBONE (University "G. d'Annunzio" di Chieti-Pescara - CAAM) Projects of the Archaeological Unit of Chieti University		Ore 18:40 A. TUNICA, A. ANHAR, (BGECo, Baieda Geoplani Company, Libya) Contribution of GIS & RS Techniques into Assessment of Cultural Heritage at Risk	
V. SCARRETTA, C. SCARRETTA (Ud'ANet srl) Presentazione della società Ud'ANet e dei suoi progetti		Martedì 27 novembre 2018	
Ore 16:00 F. TROIANI (Université Bordeaux Montaigne, Francia) Université Bordeaux Montaigne: les humanités numériques au service de l'archéologie, de l'histoire et du patrimoine		Aula Multimediale del Rettorato - Campus universitario di Chieti	
Ore 16:20 E. CALABRIA, V. ACCORREA (Istituto Centrale per l'Archeologia ICA - Ministero per i Beni e le Attività Culturali MIBAC) Presentation of the Institution and projects in progress		Ore 09:30 G. CONTI, F. VAIU (University "G. d'Annunzio" di Chieti-Pescara) Presentation on the management on behalf of UniCh of the Project EuroTeCH	
Ore 16:40 S. HENKON, D. ABARE (Cyprus Institute - STAPIC) Laboratories and Projects in the field of Cultural Heritage of the Cyprus Institute		Ore 10:00 M. BIANCHI (Università di Bologna) Ricerca e Didattica nei Progetti Europei di Management dei Beni Culturali e di Turismo culturale	
Coffee Break		Coffee Break	
Ore 17:20 P. DROZDZIK (University of Warsaw 2, Research Center) Methodologies for research and documenting the Archaeological Heritage		Ore 10:45 ROUND TABLE: issues, methodologies, administrative topics, forms, reports, outputs and events	
		Ore 12:30 VISIT TO THE LABS (CnS.I.) F. STORNA, SEM analysis in Archaeometry	

Figure 9. Program of the kick-off meeting with the contribution of Cyl researchers.

- EuroTech operational meeting organised in Cyprus (October 2018)
On 9th October 2018 an operational meeting was held at the Cyprus Institute as part of the Eurotech European Project. The meeting was attended by some of the partners of the Eurotech Project: Unich (G. d'Annunzio University of Chieti), The Cyprus Institute, Pegaso srl, Ud'aNet (the latter two electronically). Paul Bennett (Canterbury Archaeological Trust) was also present at the Cypriot meeting.



Figure 10. Visit at the facilities and laboratories of the Cyprus Institute during the operational meeting hosted at its premises.

17 October 2018. Visit and workshop for the students of the Università degli Studi 'G. d'Annunzio' Chieti - Pescara at the Cyprus Institute.

During the visit, six presentations to the students of the Italian University have been carried out: from the overview of the institute and the STARC, to specific projects developed by the researchers of the Apac Lab, such as 3D documentation with digital photogrammetry and laser scanner, 3D modelling and virtual reconstructions, landscape studies, and geometric and analytical investigations.

Moreover, during the event, the Master and PhD students had the possibility to visit the laboratories and the facilities of the Science & Technology in Archaeology and Culture Research Center and of the other Centers of the Cyprus Institute. Particularly, it has been presented the APAC Laboratories and the interdisciplinary research activities based on a broad and multi-layered diagnostic approach, integrating digital and imaging techniques with non-invasive physico-chemical analysis, integrating inorganic and organic physico-chemical methods with the reflectography, multispectral images, 2D images and 3D geometric characterization. Moreover, it has been shown another laboratory, strictly collaborating with the Apac Labs, the Unmanned Systems Research Laboratory (USRL) and its core, the laboratory, where specialized technicians, who work on the construction of different types of drones used mainly for the atmospheric control of the air, but also for archaeological research.

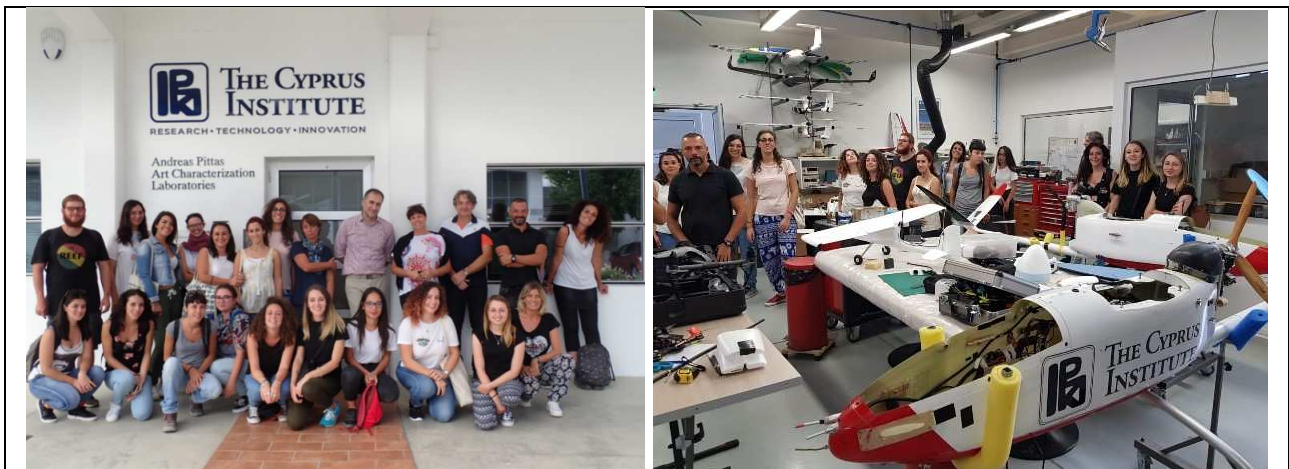


Figure 11. Visit of the students from the University 'G. d'Annunzio' Chieti - Pescara at the Cyprus Institute.

3. Mobilities of the partner

○ **3.1 Mobility activities**

- Cyprus Institute researcher short mobility (15th-17th May 2019) at the University Gabriele D'Annunzio, Chieti-Pescara (Italy).

Visit at the Archaeology Laboratories of the University Gabriele D'Annunzio Pescara.
Attendance and participation at the Congress “Behind the Buffer Zones”.

- Travel, learning, teaching and training activities: individual support (Rome - Tarquinia 11-18 September 2019)

A PhD candidate participated in a GIS course in Rome, Italy, and at a Workshop and Training at Tarquinia, Italy.

The researcher had the opportunity to follow an intensive GIS course, during which he gained experience and skills related to his research. During the four days, he learned how to analyze spatial data and use cartography techniques to communicate results in maps.

Furthermore, he could attend the one-day workshop entitled “Protocols and Best Practices in Archeology at Risk”, where topics like Guidelines for cultural heritage at risk and Risk management are addressed with an eye on current and future interventions.

During the two-days Tarquinia workshop, the researcher had the opportunity to participate in theoretical lessons on Etruscan painted tombs, the optical investigations carried out on them, and an educational workshop on the multispectral shooting was also held inside the Querciola I tomb.

Moreover, the stay at Tarquinia involved:

- The visit of the Necropolis of Tarquinia Montarozzi with the painted tombs, where someone can see the so-called tomb of the Blue Demons, as well the Tomba degli Auguri, Tomba del Barone, Tomba dei Tori, Tomba degli Scudi, Tomba delle Pantere; the latter proved to be particularly interesting not only for the beauty of the pictorial decorations but also because it is possible to view the structure of the mound by analyzing its construction techniques.
- The visit of the city's historic center where the National Archaeological Museum of Tarquinia is located in the Renaissance castle Palazzo Vitelleschi. Inside, in addition to the preserved rooms of its most ancient phase, it is possible to view the interior of the painted tombs of Tarquinia, which were detached and moved inside the museum. The museum also hosts sarcophagi and grave goods found in the necropolis of Tarquinia, a large set of architectural and sculptural elements of Etruscan production both in clay and stone, and a vast collection of black-painted ceramics. Also, inside the museum, it is possible to appreciate two precious pieces: the sculptural group of Mithras killing the bovid and the clay slab of winged horses.

The researcher also took part in the EuroTech meeting held between the partners present to plan future activities.



Figure 12. Poster of the Tarquinia conference and visit at the ancient Tarquinia.

- Cyprus Institute PhD candidate and PhD student short mobility (24th - 28th November 2021) at the Universitat Rovira i Virgili, Tarragona (Spain).

A PhD candidate and a PhD student had the possibility to visit the Universitat Rovira i Virgili in Tarragona (Spain) thanks to the mobility activities activated within the EuroTech project. Within this mobility, they have been involved in different activities, such as the visit of the University and specifically the Department of Archaeology. The two researchers had the possibility to participate in the EuroTech meetings and learn about project management and scientific research within this kind of frame. The meetings and the discussion about future projects gave the two students the opportunity to enlarge their research network for prospect activities.



Figure 13. The two Cyprus Institute PhD students at the University Rovira i Virgili of Tarragona (Spain).

Moreover, during the stay, the two students had the possibility to attend the important Fifth International Congress of Archaeology and Ancient World (Tarraco Biennial), this year dedicated to the topic “Roman harbours. Archaeology of port systems”¹, organized by the Spanish EuroTech partner (University Rovira i Virgili). Such an experience allowed the two students to learn and enlarge their knowledge on the specific topic of the conference and to know different approaches, including digital methodology for the solution of archaeological questions.



Figure 14. Participation in the International Congress of Archaeology and Ancient World.

Finally, the mobility activities also involved the archaeological visit to some of the most important sites of Tarragona in order to know about their management, preservation and conservation:

- The Cathedral of Tarragona: this site is a Roman Catholic Church declared a national monument in 1905. Also named the Cathedral of Santa Maria, it was built between the 12th and 14th centuries on the city's highest point. Previously, there had been a 10th-century mosque, a Christian Visigothic basilica, and a Roman temple. Of particular interest for the PhD students have been the Cathedral's foundations, which hides an ancient temple dedicated to Augustus. In particular, the temple's existence was known through numismatic and written references, but its location wasn't sure. In 2010, an archaeological campaign focused its attention on the central nave of the Cathedral and uncovered the remains of the Roman temple. Furthermore, the Cathedral represents a work between the Romanesque and Gothic periods. It is possible to notice a coexistence of Gothic, Renaissance, and Baroque styles.
- The Ferreres Aqueduct: also known as Pont del Diable or Devil's Bridge, represents the main attraction of this park. This aqueduct probably dates from the time of the emperor

¹ <https://www.tarracobiennial.com/ca/>

Augustus. It is located 4 kilometres north of the city. It is over two hundred metres long, carrying water from Francolí to Tarraco. The aqueduct is part of the Archaeological Ensemble of Tarraco, listed as a UNESCO World Heritage Site since 2000.

- Mausoleum of Centcelles: the PhD students visited the monumental complex of Centcelles, especially famous for the history of the land where the building is situated, its identification (mausoleum or a villa during the Roman era), and its 4th-century mosaics. Due to the exceptional architecture from the late-Roman period in Catalonia, since 2000, the complex has been included among the monuments of the ancient Tarraco and declared a UNESCO World Heritage Site.

4. Results of the specific outputs

○ 4.1 Exhibitions

- ‘Eastern Mediterranean Graffiti’ at APAC exposition space (STARC-The Cyprus Institute) (September 2019)

Under the EuroTech project educational activities, the Andreas Pittas Art Characterization Laboratories (APAC Labs) in collaboration with the project GRAFMEDIA organised an educational exhibition about Eastern Mediterranean Graffiti. The exhibition presented the potential and relevance of historic graffiti as a written source and how it can provide evidence of the visual culture and the everyday practises of people in the past using advanced imaging technologies. Visitors and students can explore how the project used advanced digital technologies to document, analyse, and study historical graffiti in different contexts and the potentials they can discover with the implementation of technology in research. The output is to enrich the knowledge concerning past societies’ with new and untapped information through the ‘voices’ of common people. Moreover, recovering past people’s voices creates a virtual connection with the past, lively and visible in the scratched, incised and painted graffiti on the surfaces of buildings and monuments that we still experience in our daily life. Find the exhibition here: <https://apac.cyi.ac.cy/?q=Easter-Mediterranean-Graffiti-Exhibition>



Figure 15. PhD students and post-docs at the exhibition “Eastern Mediterranean Graffiti” discussing the digital approach for the study of Cultural Heritage and Archaeology.

○ 4.2 Publications

- Abate D., Trentin M.G., Hidden Graffiti Identification On Marble Surfaces Through Photogrammetry And Remote Sensing Techniques, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XLII-2/W15, 2019. <https://doi.org/10.5194/isprs-archives-XLII-2-W15-1-2019>

Abstract

Nowadays, considering the various methodological approaches used by the scientific community to study graffiti, there is a need for the improvement of the documentation and analysis workflow that must be addressed. Historic graffiti are recognized by scholars of different disciplines as a relevant and genuine written source, able to provide an insight into the everyday life of the past. Many studies have indeed flourished during the last decades stating the relevance of graffiti as a multidisciplinary source of information and showing, at the same time, the fragmented research scenario due to the lack of reliable and standardized methodologies. Currently, the scientific community involved in the study of graffiti has largely benefited from the use of digital technologies. However, most of the efforts and research projects were focused on the analysis of graffiti immediately visible on the surface or graffiti the position of which was easily identifiable due to the depth and width of the engraving. The proposed study is intended to tackle the documentation pipeline a step earlier than the documentation itself when the graffiti are yet to be identified. The San Marco Basilica in Venice is used as a unique case study for the analysis of non-directly visible-to-human-eye graffiti in a rather challenging environment.

- Vassallo V., Digital analysis of Roman building complexes: the case study of the House of Tofelanus Valens (V 1,28) in Pompei. In print in Novensia Journal (novensia.uw.edu.pl)

Abstract.

The investigation of ancient architectures allows understanding their original morphology, their function, and history, and to elaborate interpretative hypotheses and reconstructions that are based on several factors, such as the constructive and static logic, the type of materials, the cultural and historical background. The use of digital technologies aims at the geometric survey of these complex structures in order to obtain an accurate 3D representation that, beyond digitally documenting and preserving them, can be used for their analysis and interpretation. In this vein, this paper is the result of an experiment to analyse complex built environments with the support of digital technologies within the Building Archaeology subject. Specifically, the analysis through 3D digital models is applied to the House of Tofelanus Valens (V 1,28) in Pompei, a building complex that is part of insula V, 1, excavated for the first time in 1875 and more recently investigated and studied by the University of Lund.

5. Collaborations during the projects

○ 5.1 3D documentation and survey

3D documentation is vital for the management and preservation of Cultural heritage at risk and under threat, including artefacts, museums, monuments, documents and sites. The knowledge captured in such documentation contributes to sustainable development, which preserves the history and cultural identity.

Within the EuroTech project, some collaborations between the partners have been established. Particularly, during the reported years, a collaboration between the Cyprus Institute and the University of Chieti-Pescara brought to the 3D documentation of specific areas of the archaeological excavation of Pyrgos (Cyprus)

- Pyrgos excavation: 3D documentation of the wall section (October 2019)
In the framework of the collaboration between the Cyprus Institute and the University of Chieti-Pescara, members of the Cyprus Institute visited the archaeological excavation site of the latter's team. The 3D documentation of an important wall section was performed by the Cyprus Institute's members with the use of a phase shift terrestrial laser scanner. To 3D document the wall of approx. 80m length the scanner was positioned in 15 different locations along the remaining wall, over a tripod, yielding an average distance scanner to an object of 3.5m. Following the next stage of the post-processing with the main aim to create a merged high-resolution 3D point cloud of this wall section. The final model is in a local georeferencing system.

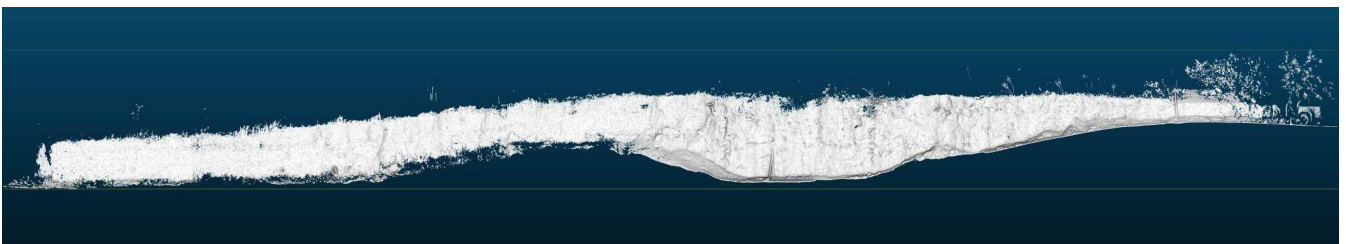


Figure 16. Pyrgos archaeological excavation site (Cyprus). A view of the point cloud of the whole wall section



Figure 17. Cyprus Institute researchers 3D documenting the wall section at Pyrgos archaeological excavation site (Cyprus)

- Hala Sultan Tekke excavation (2019 - 2021): archaeological survey and digital documentation



Figure 18. Cyprus Institute researchers at Hala Sultan Tekke excavation for digital survey

Within the framework of the research collaborations for archaeological excavations in the EuroTech project, archaeological surveys and digital documentation were carried out by the

Cyprus Institute team. Particularly, researchers from the Cyprus Institute worked at the archaeological site of Hala Sultan Tekke to survey the area. The main aim was to measure and physically define *in situ*, with high accuracy geodetic equipment, the area of the archaeological site of Hala Sultan Tekke.² Moreover, 3D documentation of the ongoing excavation and of some artefacts were carried out.

The archaeological excavation is led by the University of Gothenburg and under the collaboration between the two institutions, active participation of Cyl researchers and students had been possible during the excavation campaigns. Beyond digging, the Cyprus Institute students (Msc, PhD and Erasmus students) learned on the field about digital technologies and how to document and survey an excavation with the help of technology.

- The Alexandrian Necropolis Project: The Ptolemaic Tombs of Shatby

The participation of the researcher from the Cyprus Institute in the GIS course at Rome as well as in the one-day workshop entitled “Protocols and Best Practices in Archeology at Risk” (September 2019) allowed him to participate in “The Alexandrian Necropolis Project: The Ptolemaic Tombs of Shatby” led by the Archaeological Society of Alexandria. Within the framework of an already existing collaboration of the researcher with the Archaeological Society of Alexandria, the team of the Cyprus Institute is working on the digital documentation of the site, which will provide an invaluable record that will allow us to identify and document all threats that the site has to confront in the present and the near future. Moreover, as a direct result of the GIS course, the researcher of the Cyprus Institute will map and record data, thus allowing immediate access to the data collected for analysis and visualization both as an isolated study as well as by incorporating them with other relevant data sources to help understand the site and its findings better.

² http://www.fischerarchaeology.se/?page_id=2797