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1 Document History

- 02.12.2022 – Draft Version 0.1
- 28.12.2022 – Final version

2 Executive Summary

This deliverable describes the Trans National Access (TNA) activities carried out during the ARIADNEplus project within Work Package 11 (WP11) by CNR and describes the results achieved by this work package. CNR were responsible for the delivery of TNA entitled “Visual Media for the Documentation of Fieldwork and Artefacts” at their premises in Pisa, Italy.

The first TNA call went out in 2019 and only three person were able to complete their in-house training before the pandemic restrictions stopped travel. No further activities could be undertaken until 2021 when it was decided to organise the TNA as four Summer Schools and all previously accepted applicants were offered (and took up) places on the week-long courses.

All candidates had to send in application forms describing their projects and how these would benefit from the use of Visual Media. One of three independent reviewers each evaluated the applications and awarded a mark and recommendation to ensure the quality and relevance of the training for the applicants.

The WP11 training was designed to support researchers who wish to use visual media for the management of activities in the field and/or for the study of objects for their specific project. Participants had access to equipment and facilities in the CNR-ISTI (VCL) laboratory with technical support from the tutors, which provided the opportunity to work with state-of-the-art cameras and scanners, post-processing packages and advanced viewing platforms. Each student had the possibility to learn about creating visual media datasets for the documentation of artefacts and archaeological finds, taking in account preservation and sharing of datasets, guidance and advice were tailored to each individual project. The training concluded with a review of the results achieved and further input from local experts on continuation of the work once back home.

In total, all six applicants were offered places of which five were able to attend (one dropped out due to a serious family situation). Each student was asked to complete feedback forms after completing their TNA placements. The quality of the students and their projects as well as the training provided is reflected in the feedback. All the students were highly appreciative of the Summer School and what they had learned and from the comments, it is apparent that the Summer School catered very well to the individual requirements of each student. In terms of numbers, the attendance was lower than expected (six offers for 10 places) and if the Summer School had been able to run a year or two earlier as well, it is highly likely that the target would have been met. However, it is evident that the TNA was very well received, meeting the expectations and requirements of the students so that the lower numbers actually was a benefit for those who were able to attend.

3 Introduction and Objectives

3.1 About the Transnational Access Training Programme

The ARIADNEplus TNA Training Programme was originally planned as up to three annual calls for individual/team training for:

- Mapping Existing Datasets to CIDOC-CRM (at PIN, Prato, Italy), and
- Individual training: Data Stewardship (UoY ADS, York, UK).

The first of these calls was issued in September 2019 with visits by candidates planned for between January and June 2020, with subsequent calls to be issued in 2020 and 2021 until the maximum capacity on each course had been reached. This was 15 user weeks (75 days) for PIN and 7 user weeks (35 days) for ADS.

Two further courses were offered as week-long Summer Schools by CNR, Pisa, Italy:

- Visual Media for the Documentation of Fieldwork and Artefacts, and
- Implementing Interoperability.

The Summer Schools were planned for 2021 with the expectation (based upon previous experience) that most of the places offered, 10 and 15 weeks, respectively, were likely to be taken up in one year but with the contingency that a second set could be offered in 2022 if not.

However, the global COVID-19 pandemic and national lock-downs severely disrupted the TNA Programme as travel was restricted from spring 2020 and the situation only began to improve in 2021 with the roll-out of national vaccination programmes and reduced restrictions which allowed people to start travelling again. Consequently, the programme was revised to allow as many as possible researchers to apply and attend. All training was offered as four Summer Schools between May and July 2022 with first priority given to previously accepted applicants who were unable to attend their original placements.

3.2 Ensuring the quality of candidates

In order to provide quality training, the students attending the TNA courses had to be suitably qualified and undertaking relevant projects and research. Consequently, an independent panel of external experts was formed and the applications from each student sent to a member of the panel for review and evaluation. Guidelines were provided to assist them with this task (See Annex 9). The external evaluators were:

- Milica Tapavički-Ilić, Institute of Archaeology, Belgrade, Serbia
- Ivana Pandzic, University of Banja Luka, Bosnia Herzegovina
- David Bibby, Heritage Office, Stuttgart, Germany.

In addition, three senior ARIADNEplus members involved in the TNA delivery also received the applications and evaluations to ensure they agreed with the recommendations.

3.3 Visual Media for the Documentation of Fieldwork and Artefacts objectives

Visual Media for the Documentation of Fieldwork and Artefacts was originally offered by CNR as individual/team placements as part of the TNA Training Programme.

Work Package objectives

The goal of this TNA was to provide training and assistance on the technologies and methodologies for 3D/2D data acquisition and dataset/repository management of archaeological findings. The Visual Computing (VC) Lab at ISTI-CNR is a leading organization on this domain. The facilities offered include state-of-the-art data capture equipment, such as cameras, several 3D scanning devices based on different technologies (laser, structured light, time of flight) and the necessary hardware/software post-processing instruments (most notably MeshLab, an Open Source software developed at VC Lab with hundreds of thousands of users worldwide) and storage resources. The VC Lab offers also expertise on managing 'big' data models and advanced viewing and browsing software (most notably 3DHOP, an Open Source web framework developed at VC Lab, also with hundreds of thousands of users worldwide).

4 TNA Dissemination, evaluation and offers

4.1 The first TNA Call

The first call went out in September 2019 and widely disseminated over Social Media (Twitter, Facebook) and through the partners own dissemination channels. A leaflet was also prepared and partners asked to take these to events they organised or attended.

ARIADNEplus

Trans-National Access for Archaeologists

ARIADNEplus provides Trans-National Access (TNA) to archaeological researchers to enable them to create, manage, integrate and optimise their datasets and documentation and to participate in the use of research infrastructures. TNA is tailored to address specific research questions and projects for in-house placements and also provides training and support via two annual summer schools that cover the topics of dataset design and multimedia documentation.

In-house placements for individuals and small groups

In-house placements (normally one week in duration) are designed to give TNA participants support and training on the relevant activities needed for best practices associated with datasets:

- Mapping Existing datasets to CIDOC-CRM
hosted by PIN, Prato, Italy
- Stewardship and Curation of Archaeological Data
hosted by the Archaeology Data Service (ADS)
University of York, UK

Summer Schools

These week-long Summer Schools, hosted by CNR-ISTI, Pisa, Italy, are held June-July and aim at providing students with expert guidance and the skills and knowledge on the specific topics covered. Access to tools and services on-site help each participant progress with their specific project:

- Dataset Design & Management
- Visual Media for the Documentation of Fieldwork & Artefacts

ARIADNEplus is a project funded by the European Commission under the H2020 Programme, contract no. H2020-INFRAIA-2018-1-823914.

How to apply

Calls will be made from September 2019 every six months until March 2022 inviting candidates to apply. All information and the online form will be published on the ARIADNEplus website:
<https://ariadne-infrastructure.eu/transnational-access>

Priority will be given to:

- users who have not previously used the ARIADNEplus resources
- young researchers
- researchers working in countries where no such research facilities exist

Each application will be reviewed by a Selection Panel who will recommend which candidates are to be offered places.

Successful candidates will be awarded bursaries to cover the costs of travel and subsistence.

Further information regarding the TNA content, eligibility and the application procedure are to be found on the website.

@ARIADNEplus
www.ariadne-infrastructure.eu

The TNA Leaflet

Application forms and information were provided on the ARIADNE Infrastructure (<https://ariadne-infrastructure.eu/tna-2019-call-for-access-visits-pin-and-ads/>).

Further information on the first TNA call is provided in deliverables D9.1 and D10.1.

4.2 The second TNA call

The second TNA call for the Summer Schools was issued mid-February 2022 (<https://ariadne-infrastructure.eu/summer-schools-2022/>). These were as follows:

- Data Stewardship – ADS, University of York, UK. Online on Wednesdays 4th, 11th, 18th, 25th May and 1st June 2022.
- Mapping Existing Datasets to CIDOC CRM – PIN Scrl., Prato, Tuscany, Italy. Monday 20th–Friday 24th June 2022.
- Visual Media for the Documentation of Fieldwork and Artefacts – CNR, Pisa, Italy. Monday 27th June–Friday 1st July 2022.
- Implementing Interoperability – CNR, Pisa, Italy. Monday 4th–Friday 8th July 2022.

All four Summer Schools were promoted through the usual channels and also on the DARIAH Digital Humanities Course Register. At the same time, all the previously accepted candidates who had not received their training were contacted and asked if they would like to attend the corresponding Summer School instead.

For the *Visual Media for the Documentation of Fieldwork and Artefacts Summer School* there were six candidates of whom all were accepted. All the candidate projects were considered to be highly suitable for the training on offer.

Name	Institution	Country	Score
Marina Mateou	CYI	Cyprus	5*
Bianca Casa	CYI	Cyprus	5*
Christakis Christofides	CYI	Cyprus	4
Lara Fernandes	University of Minho	Portugal	4
Jamie Geddes	ADS, University of York	UK	4
Vera Moitinho Almeida	University of Porto	Portugal	4

*One reviewer thought 5 (not 4) was the highest score.

Unfortunately, one of the candidates (Christakis Christofides) was not able to attend the Summer School due to a serious family issue.

5 Candidate projects

This section provides an overview of each of the candidates' proposed projects as outlined in their application forms in order to illustrate the variety of applications being catered for and the specific interests covered.

5.1 Visual Media for the Documentation of Fieldwork and Artefacts Summer School (2022)

Nicosia, one of the last divided cities

This project aims to bring the lost historical culture heritage of Nicosia to the younger generation who have no memory of the city before it was divided after the war in 1974. It will build a platform for recording information about historical places and unexplored corners and end users will be able to explore the city via a game on their mobile phones using geo-location. The ultimate aim is the build up a community who can share their photos, letters, videos etc. and contribute to story telling about the old city of Nicosia. Visual media is an important element of the platform and game.

3D morphometric analyses of trauma, palaeopathologies and headshaping in ancient Cypriot human skeletal remains

This study aims to use 3D morphometric analyses to assess trauma, palaeopathologies and headshaping in ancient human skeletal remains from Cyprus. The application of 3D morphometric analyses has been seldom applied to ancient Cypriot human skeletal and dental remains, is a developing technique in human bioarchaeology, that has already been utilised in forensic science. Despite this, 3D documentation has great potential for applications on ancient Cypriot human skeletal remains, which are generally of poor preservation and require reconstruction. This project will enable the digital manipulation of 3D models of select samples for visualisation, reconstruction and metric analyses, which may in turn provide new methods of bioarchaeological analyses, and provide manipulated 3D models for inclusion in the upcoming FF:MAC exhibition at The Cyprus Museum, Nicosia, Cyprus, in the latter of 2022.

In light of the COVID-19 pandemic, the value of digital repositories of archaeological materials, including human skeletal remains has been acknowledged by researchers, bringing 3D data capture of human remains to the forefront of human bioarchaeology and thus making this project important for outlining future applications to archaeological human skeletal remains in Cyprus and the broader Eastern Mediterranean and Middle East regions.

Use of LIDAR for the rapid 3D documentation of monuments (research interest) and Inspection of monuments and conservation work on frescos (professional interest).

Much of my professional work has to do with the inspection and documentation of monuments, mainly ancient churches. I also supervise the conservation works that take place on frescos, in order to stabilize and improve their preservation condition. In both these cases I find that I need to use a device, which will allow me to easily and quickly 3D document the monument, but also to document the progress of works (before-during-after). This needs to be portable, light, powerful, user friendly, relatively cheap and easy to use. So I think that all these qualities can be found in a LIDAR 3D scanner device, and to be more accurate, in the Apple iPad Pro tablets. My objective is to assess whether or not this method can be used satisfactorily, in the every day work of professionals of the Archaeological sciences, like archaeologists, conservators, technicians etc.

Economic dynamics in the Archbishops' city: commerce and consumption in modernity

The research to be developed aims at the analysis and valorization of ceramic materials to address the economic and social aspects of the city of Braga in modern times, intending to use the archaeological materials as base documentation for the elaboration of the historical discourse. The technological and economic focus of the ceramic materials will make it possible to understand the development of production and commercial exchanges between the 15th and 18th centuries, using parameters such as formal and productive variability as relevant indicators of the economic and socio-cultural reality, arising from technological innovation, the establishment of commercial routes and the evolution of customs and tastes of the population that consumed these products.

In Braga, the Renaissance principles were inaugurated with the archbishopric of D. Diogo de Sousa, in the early 16th century (Costa, 1993), having contributed to change the medieval profile of the city, whose morphological evolution is reasonably well studied (Bandeira, 2002; Ribeiro et al., 2018), but the studies carried out on the economic dynamics of both Braga and Portugal in modern times, and especially those that examine ceramic materials, are still deficient. Thus, we have as our main objective the analysis and economic and social valuation of modern period ceramic materials, based on the contexts provided by the excavations carried out in Braga and the Braga's documentary sources, in order to understand the trade and consumption of the city in the modern period.

One of the tasks we propose to accomplish during the production of this work, among other objectives, will be to produce a morphological corpus, product of the classification and study of the modern period ceramic materials identified in the city of Braga, which includes the collection of a set of 3D data for documentation of the archaeological remains. This information will later be integrated in the Information System of the Archaeology Unit of the University of Minho (2ArchIS) and made available online at DataRepositóriUM, so that it can be online and accessible, favouring its dissemination and reuse by the academic community.

Understanding 3DHOP viewer and mapping resources to ARIADNEplus knowledgebase

I have started working on major projects such as UNPATH waters project on interoperability of marine data resources and have worked on some aspects of HS2 data, so learning new ways to share datasets and become more interoperable are vital in my role. I have also been working on major archives such as the Tracing the Past project archive that has involved the usage of 3D laser scan data and presenting the data in 3DHOP. I need to gain knowledge of the 3DHOP viewer and a greater understanding of how 3DHOP works.

Digital imaging, documentation, and visualisation of archaeological

Considering that distinct technologies may enable to detect distinct features on the object, the aim of this TNA is to further explore the potentialities of distinct 2D and 3D imaging systems for archaeological pottery research, conservation, monitoring, and dissemination. Hence my great interest in applying for this opportunity to work with state-of-the-art cameras and scanners, post-processing packages and advanced viewing platforms at the CNR-ISTI (VCL) laboratory.

Some of the potentialities of working with 3D digital data in archaeology are already well-known. The number of online databases providing open-access to 3D datasets and aggregators linking to 3D open data of CH objects for research has increased in the last decades. Concerning online databases with 3D models of ancient pottery, low resolution models are typically available, possibly mainly for fast visualisation purposes. However, crucial data, such as, raw data, high-resolution data, and corresponding technical metadata – also for repeatability and reproducibility of the data, much needed for a rapidly growing number of scientific works – seems to be overall neglected.

At the end, the goals are: (i) to apply further 2D and 3D imaging techniques to archaeological pottery; and (ii) to provide a wide variety of meaningful, searchable, citable, and reusable data for researchers. This is to say, a solid basis for distinct types of archaeological and other scientific research including, but not limited to: chronological and regional differentiation of vessel shapes, dimensions, and capacities; pottery manufacturing and function; ancient measuring systems; as well as knowledge, cultural, social, and economical networks.

6 Overview of training provided

6.1 Visual Media for the Documentation of Fieldwork and Artefacts Summer School

The Visual Media for the Documentation of Fieldwork and Artefacts Summer School goal was to introduce:

(a) the technologies for producing digital documentation for archaeological purposes, considering both the small scale (artworks, findings) and the large scale (monuments, sites); and:

(b) the methodologies for providing visual access to the data gathered (considering both desktop- and web-based visualization).

The Summer School provided both frontal lessons (presenting an introduction to the techniques) and practical hands-on sessions to test and experiment the technologies presented.

The individual work was a primary component of this Summer School experience. It was expected that students bring research projects or tasks to be accomplished during the Summer School (this had to be conceived as an attendee's open problem, to be solved with some expertise and advice contributed by the Summer School organizers), under the supervision and advice of the TNA tutors, so that practice could be made on those case studies.

The Summer School was run from the 27th June to the 1st July 2022. The Summer School program was divided into five interrelated thematic sessions delivered over a five days period. The five thematic sessions included:

- Introducing the course and the participants projects;
- Visual media creation: theory, practice, data processing;
- Visual media online: theory, practice, data publishing;
- Projects examples: case studies and best practices;
- Students projects: work on data.

Based on the stated objectives of the students' projects, it was decided to focus the Summer School on 3D data. However, ample room was left for questions about special interests or other visual media.

The full programme for the Visual Media for the Documentation of Fieldwork and Artefacts Summer School is provided as follows:

Monday 27th June

09.30 – 10.30 Welcome and registration

10.30 – 13.00 Presentation of the course: school and laboratory introduction (facilities, equipment, people)

13.00 – 14.00 Lunch

14.00 – 17.30 Presentation of the participants: discussion of participants projects/problems

Tuesday 28th June

09.30 – 13.00 Visual media creation: theory, practice, data processing

13.00 – 14.00 Lunch

14.00 – 17.30 Visual media creation: theory, practice, data processing

Wednesday 29th June

09.30 – 13.00 Visual media online: theory, practice, data publishing

13.00 – 14.00 Lunch

14.00 – 17.30 Visual media online: theory, practice, data publishing

Thursday 30th June

09.30 – 13.00 Projects examples: case studies and best practices

13.00 – 14.00 Lunch

14.00 – 17.30 Students projects: work on data

Friday 1st July

09.30 – 12.30 Students projects: closing up

12.30 – 13.00 Wrap up and conclusions

7 Evaluation of the Feedback

Each of the participants was required to complete a feedback form after they had completed their TNA training. The results of the feedback are summarised here for the individual visit and the Summer School.

7.1 Main achievements experienced during the training

- I have gained from leading experts further theoretical and practical knowledge on several issues related to 3D digital imaging, documentation, and visualisation, among other topics. Moreover, I have enhanced my skills and enlarged my network of contacts, which I hope may lead to new collaborations and to the development of innovative future projects.
- Coding, new scan ways and how to improve the scanning.
- Understanding how to use the features in Meshlab and how 3DHOP is designed.
- The training helped me as a researcher to use visual media both in the field and for the study of objects. Also important in bringing me up to date with the state of the art equipment, visualization platforms and post-processing packages with excellent guidance and advice.
- How to use MeshLab to efficiently manipulate 3D models, benefits of AI for future applications to excavation.

7.2 Any difficulties encountered during the access visit or summer school

- No. The Summer School was very well organised.
- Everyone was really helpful.
- No, really helpful, very enlightening and explained complex issues in a simple way.
- Due to falling ill, one trainer wasn't able to show Python batch processing to a student as planned.
- None.

7.3 Suggestions on how ARIADNEplus could improve the access visits/summer schools offered to the community

- It was a very interesting and productive Summer School. The trainers were very clear, always available to help and to answer questions. However, perhaps the training would benefit from extending its duration 1 more week – i.e., a 2 week Summer School, where the 1st week would be as it was and the 2nd week completely hands-on, working with our own data (and with the support and discussions from experts and colleagues).
- Maybe more funding for people who have to travel far.
- (Remaining students put 'None').

8 Conclusions

The quality of the students and their projects as well as the training provided is reflected in the feedback. All the students were highly appreciative of the Summer School and what they had learned and from the comments, it is apparent that the Summer School catered very well to the individual requirements of each student. The only regret for one student was that they were not able to cover a specific planned topic due to the trainer becoming ill but this can be possibly rectified through a video call.

Two of the students provided feedback for improving the Summer Schools but these are not really within the scope of the project as the financing and duration are limited and designed to give as many researchers the opportunity for training as possible.

In terms of numbers, the attendance was lower than expected (six offers for 10 places) and if the Summer School had been able to run a year or two earlier as well, it is highly likely that the target would have been met. However, it is evident that the TNA was very well received, meeting the expectations and requirements of the students so that the lower numbers actually was a benefit for those who were able to attend.

9 Annex - Guidelines for TNA Evaluators

The selection panel is responsible for:

- Assessing the proposals for transnational access received in response to open calls, based on the following selection criteria:
 - o Quality of the applicant,
 - o Scientific merit of the case study or individual research project proposed by the applicant,
 - o Potential benefit to the applicant from the training on offer.
- Applying the principles of transparency, fairness and impartiality to the selection process,
- Attending to gender equality.

Priority will be given to:

- Users who have not previously been awarded ARIADNE resources,
- Early career researchers,
- Researchers working in countries without comparable facilities/opportunities.

Each panel member should indicate his/her evaluation decision by indicating Accept/Reject on the application, providing a short explanation. For positive evaluations, priority should be expressed with a value from one to four (four being the highest score).

The Project Coordinator and the Deputy Coordinator will express the final decision, based on the selection criteria (see above).

Applications from researchers belonging to an ARIADNEplus partner institution are allowed and encouraged, unless they are based on the home country of the institution offering the TNA.

Eligibility criteria (to be checked by the TNA manager)

To be eligible for ARIADNEplus TNA funding, researchers need to comply with the following criteria:

- Work or be registered as a student in an institution in an EU Member State or an Associate State; researchers from institutions in the home country of the TNA opportunity are not eligible to receive an ARIADNEplus TNA bursary.
- Agree to provide feedback on TNA opportunity by:
 - o Completing an ARIADNEplus user report and returning it to TNAcontact@ariadne-infrastructure.eu,
 - o Completing the European Commission's User group questionnaire using the online form.
- Agree to their names being included in a list of ARIADNEplus TNA users provided to the European Commission and published in various media, including the Internet.
- Disseminate results obtained as a result of TNA access as widely as possible and provide ARIADNEplus with the details. Publications should include the following acknowledgement: The research leading to these results has received funding from the European Commission under the H2020 Programme, contract no. H2020-INFRAIA-2018-1-823914 (ARIADNEplus).