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ON-SITE EXPERIENCES OF THE APPLICATION OF AUGMENTED REALITY GUIDES IN ANCIENT OLYMPIA AND POMPEII

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Abstract (EN)

3D graphics and animations have been made affordable with the availability of powerful computers and have found their way into cultural heritage. Since the 00s more advanced technologies are being employed, like augmented reality. Our experience and contribution in this field lies in the implementation of the first mobile augmented reality guide for use in archaeological sites. This talk concentrates on the challenges and experiences gained within the ARCHEOGUIDE and LIFEPLUS projects, which were demonstrated at the archaeological sites of Olympia, in Greece, and Pompeii, in Italy. Technical issues are addressed alongside the usability and acceptance of these systems by CH professionals and the general public. We also present a forecast of the trends, challenges and opportunities in the near future and give a review of the benefits that cultural institutions can gain through the adoption of augmented reality and digital infrastructures.

As people become acquainted with a series of technological developments in the domain of information transfer, they become more demanding in the ways any type of information is presented to them and always seek new, effective ways of maximizing their learning experiences. Cultural institutions, such as museums, archaeological sites, cultural organizations etc. are now more than ever before in need of new ways to disseminate their assets and communicate information about it to their visitors and interested public. The current challenge for many cultural heritage organizations is to disseminate their collections according to international standards for archaeological and historical data to a multitude of information presentation devices.

Research in system development for enhanced information visualization in cultural heritage, reaches back to the nineties. Research projects addressing the issues of personalized information delivery to visitors of archaeological sites and museums delivered multiple prototypes and experience, both in terms of knowledge of optimized integration of technology as well as domain knowledge. An example for such an earlier research project deploying augmented reality to visualize information in situ is ARCHEOGUIDE, a project delivering various prototypes of portable systems to assist visitors of cultural heritage sites to better comprehend the information presented, and LIFEPLUS, a project offering location-based services and personalized augmented reality related. They have been used at Ancient Olympia and Pompeii respectively.

The user trials and evaluation of the prototypes clearly identified the need for the development of an adaptable framework for the offering of personalized, location-aware information to portable multimedia guides in museums and archaeological sites. The main target of such a development would be the creation of an end-to-end system custom-tailored to the needs of cultural heritage institutions, a system to serve as an easy-to-use tool for cultural heritage institutions, and provide effective access to new technologies.

This led to the development of the intCulture framework, a system that deals with all aspects of preparation (offline) and offering (online) of information visualization to a variety of visitors. The intCulture framework addresses the need to digitize and prepare the presentation of content only once for different types of visitors, according to well known international standards in document management and multimedia, and publish it on a series of devices over different types of networks, such as the Internet, the museum's intranet, an application domain or organization specific extranet, a wireless local area network within the museum, or wireless telephony. User-

centred design taking into account the needs of all stakeholders and actors involved in the realm of cultural heritage dissemination formed the foundation for any development in the intCulture framework.

The main focus of the presentation at ICHIM05 is the sharing of our experiences with the use of mobile augmented reality systems in the archaeological sites and the development of customizable products for use in cultural settings and tourist applications.

More specifically, the following system components will be presented in more detail:

- The Location-based services
- The Mobile, Personalized Augmented Reality
- The content management system, compliant with the MPEG-7 and a combination of Dublin-Core, CDWA and CIDOC standards.
- A domain-specific authoring tools suite based on user centred design.
- Tools for multiplatform publishing of multimedia content supporting a set of both fixed and mobile devices.
- Presentation system for various types of mobile devices that allow location-based and personalized visualization of content.

As a solution aiming at cultural heritage organizations dealing with public, intCulture offers the possibility to create content for individual visitors, small groups of friends or families, groups of tourists with or without guides etc. int-Culture provides the authoring tools for the preparation of location-based content, i.e. the definition of areas in a museum, archaeological site etc. and the straightforward assignment of information to these areas.

A set of features that is built-in in all presentations for the public may be activated by the cultural organization for their public, such as the possibility of guides to control the playback of information on the devices of other visitors (collective experience) and use speech communication to add to the presentation existing on the mobile devices. Other features are information sent out to selected visitors, or all of the visitors by the organization, bookmarking of favourite exhibits or parts of the site for the creation of a virtual “souvenir” or a folder with the highlights of the visit (e.g. to be either stored on CD-ROM, or accessed through a web-site), time control of the visit, messaging system to other visitors, etc. Additionally, centralized and distributed control and monitoring of the visitors during the visit, if equipped with mobile devices featuring the client software, resource monitoring of all available resources during playback on

mobile devices, such as battery power left etc. are possible. All these features will be demonstrated for the case of PDA-based devices.

The suggested contribution will present the research origin of the intCutlure development, hands-on experiences in the context of archaeological sites and evaluation outcomes of prototypical systems, the structure and features of the intCulture system, the necessary infrastructure and training for its deployment and the expected gains for a museum or any other cultural heritage organization.