International Cooperation on Cultural Heritage Training Using New Information Technologies

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Abstract

Information and Communication Technologies (ICTs) have an impact of increasing importance in all the application areas. This is happening also in the area Cultural Heritage (CH) with, however, not yet completely clear and defined development lines. The above consideration is particularly true in the education and training activities for Cultural Heritage. In this important cultural field, the new ICT capabilities and potentialities have not yet fully developed for actual programs and activities. In the following some general considerations are firstly presented and hence some education initiatives are described, regarding University Courses and programs. In particular e-training programs and experiments regarding the use of ICT in Cultural heritage education are presented. Some of these initiatives are not limited to Italy, but are extended to European Union Nations and potentially to other countries in the world.

Introduction

Information and Communication Technologies (ICTs) have an impact of increasing importance in all the application areas. This is happening also in the area Cultural Heritage (CH) with, however, not yet completely clear and defined development lines. Indeed the above consideration is particularly true in the education and training activities for Cultural Heritage. In this important cultural field, the new ICT capabilities and potentialities have not yet fully developed for actual programs and activities. The integration of ICTs into actual training have not yet happened to create new efficient operative education capabilities. In Italy there is an increasing interest for this field, due to the extremely important Cultural Heritage patrimony, representing not only an intrinsic cultural richness, but also significantly contributing to economy growth (e.g. through tourism activities).

Several initiatives started in Italy in last years, regarding the use of ICTs in the area of Cultural Heritage and in particular in education activities. In some Universities new degrees were launched regarding Literature, Culture and History (mainly Cultural Heritage), where ICTs were widely employed with specific new courses. In particular, at the Florence University, the Literature and Philosophy Faculty launched a University Degree (three years) for preparing "Operators for Cultural Heritage" with specific Courses on Informatics, Applied Informatics, Image Processing and Laboratories for the use of computers for digitalization, archiving, cataloguing and virtual restoration.

E-learning

For what regards e-learning, a specific Programme, called NETTUNO (Network per l'Università Ovunque), started some years ago with a degree in Cultural Heritage. Courses on Informatics and Image Processing were enclosed in the degree.

Moreover, In the last two years the Consortium CNIT (National Inter-university Consortium for Telecommunications) started a e-learning programme – as "declarate" – in English with several courses regarding the communication area (ITC), in the framework of the Project Teledoctorate, funded by the Italian Ministry for University and Scientific and Technological Research. The Courses are given through a satellite network covering Italy and part of Europe. The Teledoctorate programme offers a completely new working space to support education after master curricula, both for students who are enrolled in PhD courses in Telecommunications Engineering and people wishing to achieve new, in-depth professional knowledge in the same field. There will be two ways of accessing the modules, i.e. through a synchronous system and an asynchronous system. During the first phase, lectures are given using video and audio conferencing to maintain the current functionality of classes with great interaction between students and instructors, even if they are geographically distributed over a large territory. Instructors use standard aids, such as blackboard, graphs, etc., which are diffused to distant classes with the possibility of direct interaction with students. These lectures are delivered by using CNIT technological infrastructures, as illustrated below. Multimedia technologies enable the instructor to use even more sophisticated tools than the standard ones based on electronic presentation of slides, comment to videos, etc., which are delivered in real time to remote classes. As in the classic schooling system, lectures are scheduled with a timetable during the course. Instructors will prepare lecture notes to support the students in the learning phase, as well as sets of exercises and tests to assess the students' progress. With the asynchronous system modules can be organised without fixed schedules. The system is based on the material prepared for the synchronous service, which is then processed for self-study. Modules follow the slides and the lecture notes prepared for the synchronous service, integrated with video clips derived from the video conference. Students have access to exercises and tests to check their progress. All material is WEB based. The software platform is compatible with browsers Microsoft Internet Explorer and Netscape Navigator.
One specific Course is "Multimedia Systems for Cultural Heritage": 10 hours on TV network, about 1500 pages on Internet (with access through authorisation); covered topics regard:

- acquisition and representation of multimedia signals;
- digital representation and transforms of multimedia signals;
- digital processing techniques and operators;
- digital operators for image processing;
- virtual restoration - quality improvement;
- data compression and archives;
- copyright protection and digital marking;
- multimedia systems and telematic networks;
- Virtual Galleries

Some of the above CNIT Courses (and in particular that on "Multimedia Systems for Cultural Heritage") are distributed via satellite, not only in Europe, but also to near Nations, with a specific agreement with UNESCO.

Virtual Classrooms

Recently, the research is concentrating the attention to concepts like telepresence, immersivity, virtual reality, exploiting the most recent information and communication technologies to create an environment where the physical world meets the virtual world of services and applications. Particular interest is given to the great potentialities that these issues (i.e. distance interaction, virtual laboratories, etc.) offer for a new way to do learning. In this context, the VICom Project

(Virtual Immersive Communication) funded by the Italian Ministry of University and Research has the aim to provide an environment where people that are geographically distant are able to see/listen to one another and to collaborate, sharing the same space (real or virtual), and are able to work together for achieving common purposes. One application is the creation of an advanced virtual classroom for learning and experimentation of restoration techniques for art-works.

Let us suppose that a student (Robert) wants to participate in a course of "paintings restoration". At his University a virtual laboratory has been activated, where it is possible to simulate restoration techniques, like cleaning by means of special operators, lacuna filling, etc.
Robert enters in the laboratory, where through multimodal interfaces (like haptic interfaces (Fig. 1), natural interaction interfaces, computer vision based interfaces) and virtual collaborative environments he is able to experiment restoration techniques as in a real restoration laboratory.

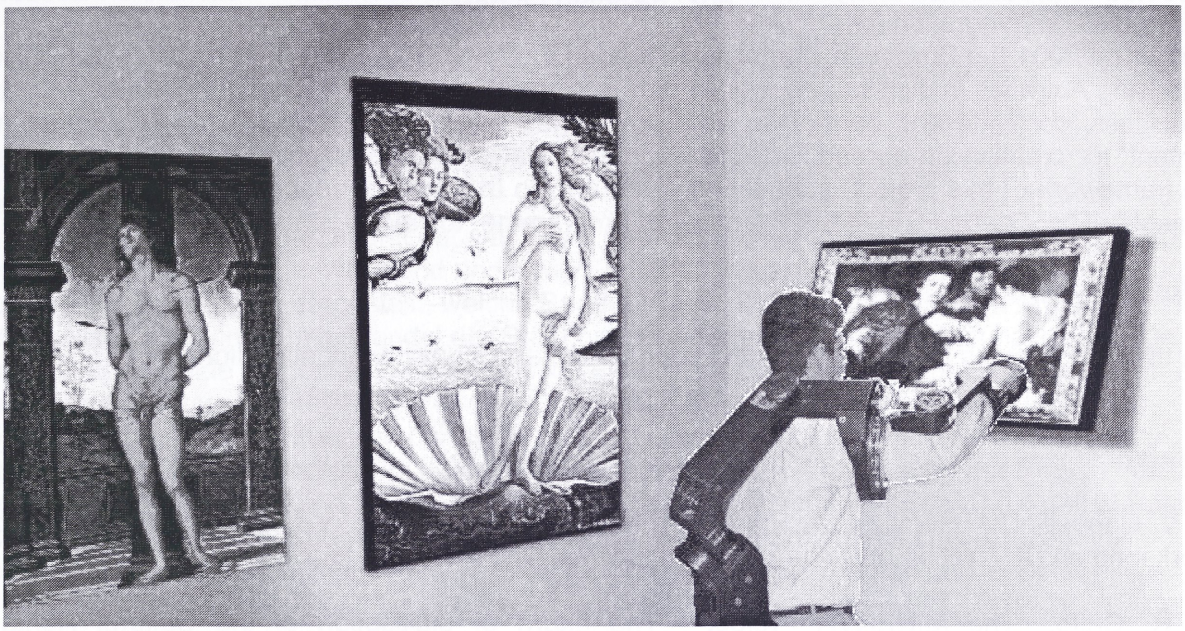

Fig. 1 – An example of haptic interface

For example, he wants to try to restore a lacuna in a region of a painting. He selects from a set of art works a particular painting and puts it on an easel. Some information (technical, artistic, historical) about the work and its possible restoration will be available for Robert. He has now the possibility to choose the particular tool to be applied on the painting and to try (in the case of lacuna restoration) different filling techniques on the same painting, thus testing the more suitable method according to the given painting.
Furthermore, by exploiting distance interaction systems, an expert restorer can guide Robert in his exercise, correcting his errors and suggesting improvements.

International Cooperation

A specific project EVAN (EVA Networking) was approved by European Commission and developed in the years 2001-2002. This support by European Commission was indeed fundamental to further develop EVA Network in Europe and the world. It was aimed essentially at using, strengthening and extending the EVA Conference networking activities to help in the dissemination of European R&D Projects in the field (over 100 funded by the EC's Cultural and Scientific Heritage Unit in Luxembourg alone), plus related Projects supported by other parts of the EC or national, regional, local and Institutional Initiatives. Some of these efforts aimed at the organization and promotion of a number of Training Courses (to a considerable extent offered free

for students and young participants), covering topics such as: quality improvement: electronic restoration and colour control, 3-D acquisition and representation, digital integrated archives, copyright protection digital marking.
Indeed, copyright (IPR) protection appears quite important also in the training area, especially when high quality data (e.g. very high resolution images) are distributed through telematic networks.
At this aim, connections with several International Organizations in the field of research and development of new technologies for Cultural Heritage fruition and education where developed. Concerning this last item, EVAN partners were invited to take part to the Expert Meeting "Education, Arts and ICTs: Integration for the Development of Personality", held at the UNESCO Institute for Information Technologies in Education (IITE) in Moscow (Russian Federation) on May 12-13, 2003. There, participants from France, Italy, Kazakhstan, Lithuania, Russian Federation, and United Kingdom, discussed aspects of ICT application in art and design education; it is expected to produce an *analytical survey*, based on the IITE Information materials on *Education, Arts and ICTs: Integration for the Development of Personality*, by the beginning of 2004.
Further on 2001 the European Commission funded the MINERVA Project (MInisterial NEtwoRk for Valorising Activities in digitisation), whose aim is to create a network of European States' Ministries to discuss, correlate and harmonise activities carried out in digitisation of cultural and scientific content, for creating an agreed European common platform, recommendations and guidelines. In the framework of this project, attention is given also to the topic of education and e-learning. This Project will be extended, in the VI Framework Programme, to NAS Countries.

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