Editors' Introduction to the Special Issue on "Virtual Reality in Cultural Heritage"

This Special Issue consists of a selection of the best papers from the 1st eHERITAGE Workshop held in 2016 as a session of the 19th international multi-conference Information Society 2016. eHERITAGE ('Expanding the Research and Innovation Capacity in Cultural Heritage Virtual Reality Applications') is a Coordination and Support project) which is addressing the challenges described in the topic H2020-TWINN-2015 of the H2020 Work programme. eHERITAGE project supports the training and transfer of know-how in the scientific area of virtual heritage, a discipline located at the intersection between new technologies and cultural heritage. Augmented and virtual reality, 3D immersive graphics, real-time haptics and intelligent systems, are all examples of technologies that can be used to provide cultural experiences in novel, more interactive ways.

When preserving cultural heritage through means of virtual reality, researchers deal with a wide array of techniques and methods. From web-based virtual assistants to photogrammetry, there are thousands of studies out there which tackle multiple areas of interest, throughout various channels of communication.

Coincidentally, the 1st eHERITAGE Workshop was held during the mid-term of the Horizon 2020, which is the largest research programme initiated by the EU in terms of financial support. One of the main goals of the EU is to finance projects which raise the awareness of the importance of heritage artefacts. In the last 25 years, a great community of scientists have learned, developed and promoted knowledge and skills needed to document, preserve and protect heritage.

The 1st eHERITAGE workshop tried to cluster all the information available from the partners into just a few areas of interest. The selected papers come from the joint efforts of the 3 partners, namely the project leader Transilvania University of Brasov (Romania), Scuola Superiore Sant'Anna of Pisa (Italy) and Jozef Stefan Institute of Ljubljana (Slovenia), and represent the work results of the first project year. They deal with two main categories: intelligent systems and virtual reality applied to the field of cultural heritage. The first paper by A. Tavčar, A. Csabam and E. Butila, "*Recommender system for virtual assistant supported museum tours*" presents a web service for virtual museum tours based on intelligent virtual assistants that can learn user preferences and provide recommendations regarding museum exhibitions. The second paper by D. Kužnar, A. Tavčar, J. Zupančič and Mihai Duguleana, "*Virtual assistant platform*", proposes a novel platform which enables the use of virtual assistants as additional services on websites or as a stand-alone application on mobile platforms. S. Butnariu, A. Georgescu and F. Gîrbacia present in the paper "*Using a natural user interface to enhance the ability to interact with reconstructed virtual heritage environments*" an assessment of the usability of natural User Interfaces used for navigation tasks in a Virtual Environment, as opposed to the traditional WIMP paradigm. The forth paper by M. Carrozzino, C. Evangelista and R. Galdieri, "*Building a 3D interactive walkthrough in a digital storytelling classroom experience*" presents a real time 3D walkthrough application based on interactive VR technologies and built with an interactive digital storytelling approach. The study was carried out with and for secondary school students in order to raise their awareness about their local heritage. The fifth paper by R. Brondi, M. Carrozzino, C. Lorenzini and F. Tecchia, "*Using mixed reality and natural interaction in cultural heritage applications*", presents a general architecture for Mixed Reality applications exploiting solutions based on Natural User Interfaces as interaction metaphors between the Virtual Environment and the user. The last paper, by C. Lorenzini, M. Carrozzino and C. Evangelista, "*An interactive digital storytelling approach to explore books in virtual environments*" presents the design and the architecture of an educational 3D application enabling reading books in Virtual Environments using an entertaining approach particularly suitable for young people.

Marcello Carrozzino
Mihai Duguleana