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| Gamified VR Storytelling for Cultural Tourism Using 3D Reconstructions, Virtual Humans, and 360o Videos  **Emmanouil Kontogiorgakis**1**, Antonis Agapakis**1#**, Aldo Jhako**1**, Emmanouil Zidianakis**1\***, Eirini Kontaki**1**, Constantina Manoli**1**, Stavroula Ntoa**1 **and Constantine Stephanidis**1,2  1 Foundation for Research and Technology Hellas, Institute of Computer Science, N. Plastira 100, Vassilika Vouton, GR-700 13 Heraklion, Greece  2 Computer Science Department, University of Crete, Heraklion, Greece  # Presenting author: Antonis Agapakis, email: agantos@ics.forth.gr  \* Corresponding author: Emmanouil Zidianakis, email: zidian@ics.forth.gr |

abstract

Today, Cultural Heritage Institutions, including museums worldwide, are in pursuit of innovative methods that could enhance the engagement of the audience, attract new audiences to the museum, and elevate the overall museum-visiting experience [1]. Digital Cultural Heritage (CH) offers new opportunities in this field, blending traditional methods of presenting cultural heritage with cutting-edge digital technologies and interactive approaches. Virtual Reality (VR) technologies are considered important facilitators of this new approach since they are capable of enhancing both the physical and the virtual aspects of the museum encounter [2], and allow the interactive exploration of CH enabling online and onsite visitors to engage with culture without being in direct contact with real artifacts. This includes visiting virtual objects and sites that are not physically present [3]. This work addresses the lack of methodologies for the seamless integration of 360◦ videos, 3D digitized artifacts, and virtual human agents within a virtual reality environment. Leveraging a treasure hunt metaphor and a storytelling approach, this combination of digital structures is capable of building an exploratory learning experience. Virtual human agents contribute to the scenario by offering personalized narratives and educational content, contributing to an enriched cultural heritage journey. Key contributions of this research include the application of a gamified approach through the treasure hunt metaphor, and the seamless integration of the aforementioned technological approaches to enhance user engagement. The output of this work is a VR Treasure Hunt that invites users to navigate a virtual world and solve a series of puzzles. These puzzles are directly connected to the history, cultural heritage, events (such as periodic exhibitions of particular museums), monuments, customs, and traditions of the city of Heraklion. The goal is to highlight and interconnect selected routes in a way that captivates users and encourages them to explore the city's historical data.

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