Call and Scope

Virtual heritage – the use of digital and virtual technologies for cataloguing and conveying our cultural heritage – offers exciting new ways to experience the cultural treasures of the world, both ancient and modern. Virtual heritage research in past decades has focused mainly on the visual aspect of heritage information processing. Optical scanning technology, remote sensing, sophisticated 3D modelling tools and developments in efficient computer graphics rendering pipelines have fuelled worldwide virtual reconstructions of tangible heritage. Such needs prompted funding councils and agencies to reserve and distribute resources in order to support the development of technologies and methodologies that made digital restoration, preservation and conservation possible. The visualisation and real-time interactive aspects of such developments have since provided access and availability of existing — and lost — tangible heritage to be studied and experienced via their virtual representations. As we review the present state of virtual heritage research, however, we realize that there remains a gap in the discipline. Most applications lacked life, behaviour, and intelligent agents in the virtual environments, and there has not been any progression in such developments since a decade ago. Reconstructions of heritage as elaborate virtual manifestations of materiality are without life, if they are without representations of life and behavior as intangible heritage representations in the virtual environment.

Technological progression, particularly in the information and computational sciences, is creating new research opportunities for virtual heritage and computational archaeology communities. Researchers in these disciplines are discovering new tools and ways of interpreting virtual representations of objects, monuments and environments, using agent-based models, evolvable and responsive virtual environments dwelt by avatars and agents. These new ways of discovering and seeing intangible information looks to become the next stage of virtual heritage research, with two main communities of potential users. For the public, the integration of living and adaptive virtual agents and responsive environments could give virtual heritage
applications a richer, more evolvable content, and a higher level of interactivity and experience. For researchers, particularly in recent trends in computational archaeology, the potentials for the use of the approach for filling gaps in the information space looks to be very prospective indeed.

The objective of this Special Issue on Living Virtual Heritage is to examine the state of development in the vibrant virtual heritage community. The scope of the issue includes but is not limited to the topics listed here:

- New Approaches in Virtual Heritage Applications and Interpretations
- Responsive, Adaptive and Evolvable Behaviors in Virtual Heritage Environments
- Complex Systems Approaches: Artificial Life, Agent-Based Modelling and Multiagent Systems
- Enhanced Virtual Environments and Multiuser Virtual Heritage
- Mixed Reality and the Experience of Real and Virtual Heritage Environments
- Virtual Presence and Phenomenology in Virtual Heritage Applications
- Distributed Virtual Heritage Environments
- Tools, Techniques, Frameworks and Methodology for Living Virtual Heritage

Keywords: Agent-based modelling, multiagent systems, artificial life, virtual heritage, computational archaeology, visualization, mixed reality, virtual environments, phenomenology

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