

DRAFT 2.1

7 February 2009

THE LONDON CHARTER

**FOR THE COMPUTER-BASED VISUALISATION OF CULTURAL
HERITAGE**

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PREAMBLE

While computer-based visualisation methods are now employed in a wide range of contexts to assist in the research, communication and preservation of cultural heritage, a set of principles is needed that will ensure that digital heritage visualisation is, and is seen to be, at least as intellectually and technically rigorous as longer established cultural heritage research and communication methods. At the same time, such principles must reflect the distinctive properties of computer-based visualisation technologies and methods.

Numerous articles, documents, including the AHDS Guides to Good Practice for CAD (2002) and Virtual Reality (2002) and initiatives, including the Virtual Archaeology Special Interest Group (VASIG) and the Cultural Virtual Reality Organisation (CVRO) and others have underlined the importance of ensuring both that computer-based visualisation methods are applied with scholarly rigour, and that the outcomes of research that include computer-based visualisation should accurately convey to users the status of the knowledge that they represent, such as distinctions between evidence and hypothesis, and between different levels of probability.

The London Charter seeks to capture, and to build, a consensus on these and related issues in a way that demands wide recognition and an expectation of compliance within relevant subject communities. In doing so, the Charter aims to enhance the rigour with which computer-based visualisation methods and outcomes are used and evaluated in heritage contexts, thereby promoting understanding and recognition of such methods and outcomes.

The Charter defines principles for the use of computer-based visualisation methods in relation to intellectual integrity, reliability, documentation, sustainability and access.

The Charter recognises that the range of available computer-based visualisation methods is constantly increasing, and that these methods can be applied to address an equally expanding range of research aims. The Charter therefore does not seek to prescribe specific aims or methods, but rather establishes those broad principles for the use, in research and communication of cultural heritage, of computer-based visualisation upon which the intellectual integrity of such methods and outcomes depend.

The Charter is concerned with the research and dissemination of cultural heritage across academic, educational, curatorial and commercial domains. It has relevance, therefore, for those aspects of the entertainment industry involving the reconstruction or evocation of cultural heritage, but not for the use of computer-based visualisation in, for example, contemporary art, fashion, or design. As the aims that motivate the use of visualisation methods vary widely from domain to domain, Principle 1: “Implementation”, signals the importance of devising detailed guidelines appropriate to each community of practice.

OBJECTIVES

The London Charter seeks to establish principles for the use of computer-based visualisation methods and outcomes in the research and communication of cultural heritage in order to:

Provide a benchmark having widespread recognition among stakeholders.

Promote intellectual and technical rigour in digital heritage visualisation.

Ensure that computer-based visualisation processes and outcomes can be properly understood and evaluated by users

Enable computer-based visualisation authoritatively to contribute to the study, interpretation and management of cultural heritage assets.

Ensure access and sustainability strategies are determined and applied.

Offer a robust foundation upon which communities of practice can build detailed London Charter Implementation Guidelines.

PRINCIPLES

Principle 1: Implementation

The principles of the London Charter are valid wherever computer-based visualisation is applied to the research or dissemination of cultural heritage.

- 1.1 Each community of practice, whether academic, educational, curatorial or commercial, should develop London Charter Implementation Guidelines that cohere with its own aims, objectives and methods.
- 1.2 Every computer-based visualisation heritage activity should develop, and monitor the application of, a London Charter Implementation Strategy.
- 1.3 In collaborative activities, all participants whose role involves either directly or indirectly contributing to the visualisation process should be made aware of the principles of the London Charter, together with relevant Charter Implementation Guidelines, and to assess their implications for the planning, documentation and dissemination of the project as a whole.
- 1.4 The costs of implementing such a strategy should be considered in relation to the added intellectual, explanatory and/or economic value of producing outputs that demonstrate a high level of intellectual integrity.

Principle 2: Aims and Methods

A computer-based visualisation method should normally be used only when it is the most appropriate available method for that purpose.

- 2.1 It should not be assumed that computer-based visualisation is the most appropriate means of addressing all cultural heritage research or communication aims.
- 2.2 A systematic, documented evaluation of the suitability of each method to each aim should be carried out, in order to ascertain what, if any, type of computer-based visualisation is likely to prove most appropriate.
- 2.3 While it is recognised that, particularly in innovative or complex activities, it may not always be possible to determine, *a priori*, the most appropriate method, the choice of computer-based visualisation method (e.g. more or less photo-realistic, impressionistic or schematic; representation of hypotheses or of the available evidence; dynamic or static) or the decision to develop a new method, should be based on an evaluation of the likely success of each approach in addressing each aim.

Principle 3: Research Sources

In order to ensure the intellectual integrity of computer-based visualisation methods and outcomes, relevant research sources should be identified and evaluated in a structured and documented way.

- 3.1. In the context of the Charter, research sources are defined as all information, digital and non-digital, considered during, or directly influencing, the creation of computer-based visualisation outcomes.
- 3.2 Research sources should be selected, analysed and evaluated with reference to current understandings and best practice within communities of practice.
- 3.3 Particular attention should be given to the way in which visual sources may be affected by ideological, historical, social, religious and aesthetic and other such factors.

Principle 4: Documentation

Sufficient information should be documented and disseminated to allow computer-based visualisation methods and outcomes to be understood and evaluated in relation to the contexts and purposes for which they are deployed.

Enhancing Practice

- 4.1 Documentation strategies should be designed and resourced in such a way that they actively enhance the visualisation activity by encouraging, and helping to structure, thoughtful practice.
- 4.2 Documentation strategies should be designed to enable rigorous, comparative analysis and evaluation of computer-based visualisations, and to facilitate the recognition and addressing of issues that visualisation activities reveal.
- 4.3 Documentation strategies may assist in the management of Intellectual Property Rights or privileged information.

Documentation of Knowledge Claims

- 4.4 It should be made clear to users what a computer-based visualisation seeks to represent, for example the existing state, an evidence-based restoration or an hypothetical reconstruction of a cultural heritage object or site, and the extent and nature of any factual uncertainty.

Documentation of Research Sources

- 4.5 A complete list of research sources used and their provenance should be disseminated.

Documentation of Process (Paradata)

- 4.6 Documentation of the evaluative, analytical, deductive, interpretative and creative decisions made in the course of computer-based visualisation should be disseminated in such a way that the relationship between

research sources, implicit knowledge, explicit reasoning, and visualisation-based outcomes can be understood.

Documentation of Methods

- 4.7 The rationale for choosing a computer-based visualisation method, and for rejecting other methods, should be documented and disseminated to allow the activity's methodology to be evaluated and to inform subsequent activities.
- 4.8 A description of the visualisation methods should be disseminated if these are not likely to be widely understood within relevant communities of practice.
- 4.9 Where computer-based visualisation methods are used in interdisciplinary contexts that lack a common set of understandings about the nature of research questions, methods and outcomes, project documentation should be undertaken in such a way that it assists in articulating such implicit knowledge and in identifying the different lexica of participating members from diverse subject communities.

Documentation of Dependency Relationships

- 4.10 Computer-based visualisation outcomes should be disseminated in such a way that the nature and importance of significant, hypothetical dependency relationships between elements can be clearly identified by users and the reasoning underlying such hypotheses understood.

Documentation Formats and Standards

- 4.11 Documentation should be disseminated using the most effective available media, including graphical, textual, video, audio, numerical or combinations of the above.
- 4.12 Documentation should be disseminated sustainably with reference to relevant standards and ontologies according to best practice in relevant communities of practice and in such a way that facilitates its inclusion in relevant citation indexes.

Principle 5: Sustainability

Strategies should be planned and implemented to ensure the long-term sustainability of cultural heritage-related computer-based visualisation outcomes and documentation, in order to avoid loss of this growing part of human intellectual, social, economic and cultural heritage.

- 5.1 The most reliable and sustainable available form of archiving computer-based visualisation outcomes, whether analogue or digital, should be identified and implemented.
- 5.2 Digital preservation strategies should aim to preserve the computer-based visualisation data, rather than the medium on which they were originally stored, and also information sufficient to enable their use in the future, for example through migration to different formats or software emulation.
- 5.3 Where digital archiving is not the most reliable means of ensuring the long-term survival of a computer-based visualisation outcome, a partial, two-dimensional record of a computer-based visualisation output, evoking as far as possible the scope and properties of the original output, should be preferred to the absence of a record.
- 5.4 Documentation strategies should be designed to be sustainable in relation to available resources and prevailing working practices.

Principle 6: Access

The creation and dissemination of computer-based visualisation should be planned in such a way as to ensure that maximum possible benefits are achieved for the study, understanding, interpretation, preservation and management of cultural heritage.

- 6.1 The aims, methods and dissemination plans of computer-based visualisation should reflect consideration of how such work can enhance access to cultural heritage that is otherwise inaccessible due to health and safety, disability, economic, political, or environmental reasons, or because the object of the visualisation is lost, endangered, dispersed, or has been destroyed, restored or reconstructed.

- 6.2 Projects should take cognizance of the types and degrees of access that computer-based visualisation can uniquely provide to cultural heritage stakeholders, including the study of change over time, magnification, modification, manipulation of virtual objects, embedding of datasets, instantaneous global distribution.

APPENDIX – Glossary

The following definitions explain how terms are used within this document. They are not intended to be prescriptive beyond that function.

Computer-based visualisation

The process of representing information visually with the aid of computer technologies.

Computer-based visualisation method

The systematic application, usually in a research context, of computer-based visualisation in order to address identified aims.

Computer-based visualisation outcome

An outcome of computer-based visualisation, including but not limited to digital models, still images, animations and physical models.

Cultural heritage

The Charter adopts a wide definition of this term, encompassing all domains of human activity which are concerned with the understanding of communication of the material and intellectual culture. Such domains include, but are not limited to, museums, art galleries, heritage sites, interpretative centres, cultural heritage research institutes, arts and humanities subjects within higher education institutions, the broader educational sector, and tourism.

Dependency relationship

A dependent relationship between the properties of elements within digital models, such that a change in one property will necessitate change in the dependent properties. (For instance, a change in the height of a door will necessitate a corresponding change in the height of the doorframe.)

Intellectual transparency

The provision of information, presented in any medium or format, to allow users to understand the nature and scope of “knowledge claim” made by a computer-based visualisation outcome.

Paradata

Information about human processes of understanding and interpretation of data objects. Examples of paradata include descriptions stored within a structured dataset of how evidence was used to interpret an artefact, or a comment on methodological premises within a research publication. It is closely related, but somewhat different in emphasis, to “contextual metadata”, which tend to communicate interpretations of an artefact or collection, rather than the process through which one or more artefacts were processed or interpreted.

Research sources

All information, digital and non-digital, considered during, or directly influencing, the creation of the computer-based visualisation outcomes.

Subject community

A group of researchers generally defined by a discipline (e.g. Archaeology, Classics, Sinology, Egyptology) and sharing a broadly-defined understanding of what constitute valid research questions, methods and outputs within their subject area.

Sustainability strategy

A strategy to ensure that some meaningful record of computer-based visualisation processes and outcomes is preserved for future generations.

Editor: Hugh Denard, King’s College London, 7 February 2009