J Comput Eng Inf Technol 2017, 6:6(Suppl)
DOI: 10.4172/2324-9307-C1-018

The role of similarity in the study of fractured artefacts in cultural heritage

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Digital manipulation and analysis of tangible cultural objects has the potential to bring about a revolution in the way classification, stylistic analysis, or refitting of fragments is handled in the cultural heritage area. Similarity evaluation is underlying most of these challenges, as the ability to reason on the several and diverse artefact properties, which may relate to geometric attributes (e.g., spatial extent, aspect), to colorimetric properties (e.g., colour, texture), to specific traits that fragments exhibit (e.g., decorations), or to metadata documenting the artefacts. 3D modelling, processing and analysis are now mature enough to allow handling 3D digitized objects as if they were physical, and semantic models allow for a rich documentation of many different aspects of artefacts or assets of any complexity, as well as of contextual information about them. In this context, the talk will give an overview of issues and trends related to the analysis, presentation and documentation of digital cultural assets, with focus on the research challenges tackled within the EC project GRAVITATE: Re-unification, as the process of discovering parts of the same object held in different collections and evaluate if and how they could fit together; Re-assembly, which consists in digitally recreating an historical artefact by the set of its fragments; Re-association of objects, which allows researchers to look for new understanding and insights into the movement and links between different communities on the basis of similar artefacts found in different locations.

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