

Capitalizing on the State-of-the-Art in Preserving Complex Visual Digital Objects: The POCOS Project

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ABSTRACT

Complex visual digital objects and environments present the digital preservation community with distinct challenges. Complex visual objects predominantly feature interactivity properties, time-based components and intricate interdependencies which incorporate composite, heterogeneous, and often bespoke technologies. Work recently undertaken in major EC-funded projects has highlighted that continuing progress in preserving complex digital materials is achievable through engagement with relevant communities and amalgamation of research results and emerging good practices. The JISC-funded project Preservation of Complex Objects Symposia (POCOS) addresses these issues by creating a template for leading researchers and practitioners to present their findings and set out the future directives in this field. To this end, POCOS will deliver a series of three symposia focusing on three respective areas: Simulations and Visualizations, Software-based Art and Gaming Environments and Virtual Worlds. POCOS aims to promote broader appreciation of the state-of-the-art in preserving complex objects, provide input to collections management and create fertile ground for future collaborations between academia and industry.

Categories and Subject Descriptors

J.5 [Computer Applications]: Arts and Humanities – *Fine Arts*
K.4 [Computers and Education]: Computers and Society – *Miscellaneous*
K.8 [Personal Computing]: General - *Games*

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General Terms

Management, Documentation, Human Factors, Standardization, Theory, Legal Aspects

Keywords

complex visual objects, digital preservation, software art, simulations and visualizations, gaming environments.

1. INTRODUCTION

As the use of digital resources has started to include more complex structures and environments, digital curation and preservation professionals are confronted by the intellectual and logistical challenges that this shift implies. Complex visual digital objects have moved beyond the experimental sphere: they are becoming increasingly central to learning and research environments [e.g. 1, 2, 3], and their role as records of modern culture is equally recognized by heritage and memory institutions [e.g. 4, 5].

The challenges posed to digital preservation can be witnessed in a number of fronts. Technically, complex visual digital objects feature interactivity properties, time-based components and intricate interdependencies which incorporate composite, heterogeneous, and often custom-built technologies. Digital preservation has thus far predominantly focused on migration-based approaches for core digital formats – for instance, research data and textual representations – whose applicability is arguable when dealing with the complexity of materials such as video games and three dimensional virtual worlds. Conceptually, complex, born-digital visual artifacts deviate from traditional (analogue) media and are difficult to describe and document in a formalized manner. As previous studies have shown [e.g. 6, 7] the results from applying existing archival theory and metadata standards to complex objects can be highly variable. Attempting to include born-digital visual objects (or at least references to them) in structured repositories and digital libraries can introduce further complications [8]. Historically, complex digital materials are a relatively young medium within artistic, educational and

research contexts and therefore the deriving artifacts “do not have that history of production and scholarship, nor is there time to ‘hope for the best’ in terms of preservation” [9]. Under this prism, it is imperative to provide a template for synergies between researchers and practitioners in otherwise disparate fields, thus generating knowledge economies and ultimately contributing to a collective memory in the area of complex digital objects so that “it can benefit from remembering its past more systematically.” [10]

These are the issues that the Preservation of Complex Objects Symposia (POCOS)¹ project addresses. With funding from the Joint Information Systems Committee (JISC)², POCOS will deliver a series of three symposia across the United Kingdom with the aim to bring together the leading researchers and practitioners in the field and invite them to present their findings, identify key unsolved problems, and map out the future research agenda for the preservation of complex visual materials and environments. The fundamental task facing the POCOS symposia is to present material of great technological and organizational complexity in a lucid, cogent, relevant and approachable manner so as to engage HEIs’ researchers and practitioners in a wide variety of disciplines, as well as reaching those further afield in, for example, commerce, industry, cinema and government. The ultimate goal of POCOS is to promote a broader appreciation of the state-of-the art in preserving complex objects, provide input to collections management and create fertile ground for future collaborations between academia and industry.

2. POCOS SYMPOSIA

Throughout 2011 POCOS will hold symposia in London, Glasgow and Cardiff. Although each symposium is organised by a specific project partner, the interrelations among the three domains of focus and their respective digital preservation issues further promote the definition of good practice guidelines in a collaborative manner. The three non-orthogonal areas of the symposia highlight the potential of synergies in preserving complex objects, allowing at the same time for deliberations on digital preservation theory and practice that is specific to each area.

2.1 Simulations & Visualizations

Proprietary data formats, proprietary methods and processes, and inaccurate data structures [11] are just a few of the problems pertaining 3D modelling. Successful preservation of 3D models depends on a number of parameters, including identification of file formats, specification of technical characteristics and standardisation of metadata models. Furthermore, accurate interpretation of 3D models depends on the persistence of the software used to create, render and display the deriving products. Through presentation of real-life case studies, focused discussion and networking activities the POCOS symposium on Simulations and Virtualisations deals with such issues as intellectual transparency in 3D cultural heritage material, the role of virtual museums and preservation of mixed reality representations of heritage sites. The symposium is organised by the King's

Visualisation Lab³ based at the Centre for Computing in the Humanities, King's College London.

2.2 Software Art

The integration and manipulation of technology as a form of artistic expression has been an active and growing genre for more than fifty years. Software-based artworks have been commissioned and displayed in major museums across the globe, therefore emphasising on the need to curate, manage and preserve such material. Preservation of software-based art presents challenges in many fronts, including complex interdependencies between objects; time-based and interactive properties; and diversity in the technologies and practices used for development [12]. Although some guidelines exist for preserving and curating software-based artworks [e.g. 13], there currently exist no agreed upon methods and techniques that can broadly constitute ‘good practice’. With contributions from artists, software engineers, museum and gallery curators, as well as representatives from academia and research, the POCOS symposium on software art addresses such topics as the implications and advances in preserving software-based art, issues of ephemerality, significant properties for software-based art, connections with software preservation in general, and software-based art as *performance*. The symposium is organised by the Humanities Advanced Technology & Information Institute⁴ at the University of Glasgow.

2.3 Gaming Environments

Video games have been a prominent feature of popular culture with a history that spans more than five decades. Similarly, prototypical implementations of virtual worlds appeared as early as 1974 and have nowadays exploded into such phenomena as Massively multiplayer online role-playing games (MMORPGs) and Second Life⁵. Despite their role in shaping and expressing socio-cultural identity, preservation of gaming environments and virtual worlds did not gain serious attention until recently. The POCOS symposium on Gaming Environments and Virtual Worlds brings together outstanding game developers, virtual worlds producers, academics, heritage institutions and members of the experimental gaming community in an effort to synchronise their actions towards preserving their assets and reach an understanding in terms of best practices, legal implications and future directives. Key topics include digital games preservation and exhibitions, digital games/virtual worlds history and documentation, computer demos preservation and their alignment with software preservation in general. The symposium is organized by Joguinsas, France⁶.

3. PROJECT OUTPUTS

The POCOS project will release selected content from the symposia as video footage and audio on popular media sharing platforms, so as to communicate the deliberations to the broader international community and generate material of lasting value. After conclusion of each symposium, a peer-reviewed publication

¹ <http://www.pocos.port.ac.uk/>

² <http://www.jisc.ac.uk/>

³ <http://www.kvl.cch.kcl.ac.uk/>

⁴ <http://www.gla.ac.uk/departments/hatii/>

⁵ <http://secondlife.com/>

⁶ <http://www.joguinsas.com/>

will be prepared with key texts that encapsulate the content of the POCOS events and provide concrete recommendations and pointer for future directions. The publications will be disseminated in a variety of electronic means and retained in an open-access institutional repository.

4. OUTCOMES AND FUTURE WORK

POCOS envisages delivering results within the three domains of focus and also providing input to the greater digital preservation field. As it has been exhibited throughout this paper, the project aims to stimulate a broader appreciation of the state-of-the-art research in the area of preservation of complex digital objects, working at the same time towards a consensus on potential future avenues of research and practice. The corpus of published material is meant to provide input to the strategic planning of holders of collections of complex materials and environments, helping institutions to synchronise their practices between core and complex objects. By exploiting the possibilities that interrelations between the domains of focus offer, POCOS seeks the creation of new research networks to pursue such research and harness its outputs in a coordinated and more cost-effective manner. As opposed to previous efforts that have focused on technical and conceptual issues pertaining to complex visual digital objects, POCOS suggests that, in order to continue to make progress, it is important to engage and energize the wider DP community. This paper has summarized the key topics from which the POCOS project was forged, and has demonstrated the importance and timeliness of this work.

5. ACKNOWLEDGMENTS

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6. REFERENCES

- [1] Baranowski, T., Buday, R., Thompson, D. I., & Baranowski, J. (2008). Playing for Real: Video Games and Stories for Health-Related Behavior Change. *American Journal of Preventive Medicine*, 34(1), 74-82.
- [2] Beacham, R. (2008). "Oh, to make boards to speak! There is a task!": Towards a Poetics of Paradata. In M. Greengrass and L. Hughes (Eds). *The Virtual Representations of the Past* (pp. 171-178). Aldershot, Hants, England ; Burlington, VT : Ashgate.
- [3] Konstantelos, L. (2009). Digital art in digital libraries: a study of user-oriented information retrieval. PhD thesis, University of Glasgow.
- [4] Paul, C. (2008). *New media in the white cube and beyond: Curatorial models for digital art*. Berkeley: University of California Press.
- [5] Manovich, L. (2003). *Making art of databases*. Rotterdam: V2 Pub./NAi Pub.
- [6] Rinehart, R. (2004). A System of Formal Notation for Scoring Works of Digital and Variable Media Art. Paper presented at the Electronic Media Group, Annual Meeting of the American Institute for Conservation of Historic and Artistic Works, Portland, Oregon.
- [7] Depocas, A., Ippolito, J., & Jones, C. (2003). *Permanence through change: The variable media approach*. New York: Guggenheim Museum Publications.
- [8] Konstantelos, L. (2007). Putting the content, user and quality concepts in the digital library universe into practice: a scenario based on a user-oriented study for digital art material. In: Castelli, D. and Ioannidis, Y. (eds.) *Proceedings of the Second Workshop on Foundations of Digital Libraries*. Information Society Technology Press, pp. 22-30.
- [9] Dalbello, M., Marty, P., Paling, S., Simon, S., Walsh, J., Winget, M., et al. (2008). Mapping work in the arts and humanities: A participatory panel discussion. *Proceedings of the American Society for Information Science and Technology*, 45(1), 1-3.
- [10] Manovich, L. (2003). Don't Call It Art: *Ars Electronica 2003*. Retrieved March 16, 2011, from http://www.manovich.com/DOCS/ars_03.doc
- [11] Vilbrandt, C., Pasko, A., Pasko, G., Goodwin, J.R., & Goodwin, J.M. (2001). Digital Preservation of Cultural Heritage through Constructive Modeling. *Proceedings of the International Cultural Heritage Informatics Meeting (ichim01)*, Milano, Italy, September 3-7, 2001.
- [12] Cox, G. (2010). *Antithesis: the Dialectics of Software Art*. Aarhus, DK: Digital Aesthetics Research Center.
- [13] Boudrias, E., Mingarelli, A., Driss, O., and Gangier, R. (2009). *A Preservation Guide for Technology-Based Artworks*. Available from the Documentation and Conservation of the Media Arts Heritage (DOCAM): <http://www.docam.ca/en/conservation-guide.html>