

AVI2CH 2020: Workshop on Advanced Visual Interfaces and Interactions in Cultural Heritage

The rapid development of ICT and the Internet has enabled cultural heritage (CH) institutions to provide access to their collections in multiple various ways, both onsite and online, and to attract even wider audiences than those that visit the physical museums. In parallel and part of the above, there is an enormous growth in user interfaces and in information visualization technologies. These range from tiny smart watch screens to wall-size large public displays as well as applications of 3D technologies in virtual museums, and Augmented Reality to enhance experience in real CH sites.

The use of (web) 3D in CH promotion allows the general public to live immersive experiences in virtual, reconstructed locations, like ancient towns and locations, and to visit existent, but remotely located locations, such as world-wide cultural institutions (such as Google Art Project¹). For preservation purposes, web 3D provides scholars and CH professionals with a way to consult and maintain visual repositories of real exhibits, with the possibility of visualizing, comparing and studying 3D digital equivalents of real artworks physically situated in different locations. CH is one challenging domain of application for such novel ICT technology.

Advanced and natural human-computer interaction is a key factor in enabling access to cultural heritage. AVI, whether they are tiny mobile screens or large wall mounted displays, can all be part of a ubiquitous CH infrastructure, where information can be personalized and displayed/projected, on screens or overlaid on real objects and advanced form of interaction could be experimented with (e.g., gestural interaction, augmented interaction, vocal interaction, etc.). Since years, social robots have also been used to enhance the user experience in a museum visit.

Following the wealth of studies and publications in recent years focusing on exploring the potential of novel technology to enhance CH experience, and the success of previous workshops (AVI CH 2018, SMAP 2019), the goal of the workshop is again to bring together researchers and practitioners interested in exploring the potential use of state-of-the-art AVI in enhancing our daily CH experience also in the light of new issues related to the COVID 19 emergency.

AVI²CH Papers

Eleven papers presented in the AVI²CH 2020 workshop and are reported in full in CEUR proceedings. They ranged in type and topic. A brief discussion on them follows.

Several papers focus on the visitor experience. *Cultural Heritage and Social Experiences in the Times of COVID 19*, [11], studied the way institutions are and could be addressing the challenges during lockdown when there are no physical visitors. This is of immediate relevance but also many of the lessons such as "stories are about people, not things" are ones that will persist beyond the current crisis. *Using Mobile Devices as Activity Aids in a History Museum*, [8], looks at the way mobile devices can be used within a museum to enhance informal learning. A substantial aspect of this paper is evaluation and the contribution of [5] - *Assessment of Digital Environments for Cultural Heritage Communication*, looks more broadly at the effectiveness of interactive experiences across a broad number of reported applications. Most of the systems they surveyed included some element of augmented or mixed reality and *"Take me Home": AR to Connect Exhibits to Excavation Sites*, [1] describes a particular AR system designed to connect artefacts held inside a museum to the site where

¹ <https://artsandculture.google.com/>

they originate. Although the obvious sense here is visual imagery, a crucial point, linking back to the first paper in this group, is that narrative emerges as a central aspect of visitor experience.

Other papers focus on novel systems and interaction techniques. *From Pixels to Notes: A Computational Implementation of Synaesthesia for Cultural Artefacts*, [7], considers ways to bring senses together when appreciating a painting or other cultural artefact. Taking inspiration from the psychological study of synaesthesia, they consider ways to create artificial experiences that bring sound and vision together. [6] focus on the visual experience in *Using Eye Tracking Data to Understand Visitors' Behaviour*, creating innovative methods to create eye gaze heat maps in the highly challenging environment of a real museum where it is not possible to control many contextual and environmental variables. *Pepper4Museum: Towards a Human-like Museum Guide*, [3], also uses complex image processing in order to enhance the social interactions of a robotic museum guide. It allows the social robot to modify its behavior depending on perceived characteristics of the user.

Moving into the inter-human social domain *Towards Advanced Interfaces for Citizen Curation*, [2], considers ways to allow visitors' voices to be heard in addition to the normal authoritative account of an artefact. The SPICE project aims to allow this across objects held in multiple physical sites. *Public Participation in Museums and Cultural Heritage Sites: the iCommunity Mobile Application*, [10], continues this theme of empowerment and connection, but spreading further out to the broader community, looking not just as what they feel about a specific artefact, but the way the heritage site itself is part of the identity and development of the communities in which they are situated.

The final two papers look at different forms of data management for both visitor and expert. *Bringing Digital Curation to Archaeological projects: evidence from the BeArchaeo project*, [9], looks at the very first point at which objects, measurements and activities at an excavation can be captured and connected in ways that allow multiple experts both at the scene and retrospectively for scholarship and public dissemination. In *ICT driven platform for high-quality virtual contents creation and sharing with e-tourism purposes. The Interreg IT-HR REMEMBER project*, [4] describes a cloud-based system that connects digital representations of cultural artefacts from eight Adriatic ports. Their purpose is not just about enhancing visitor experience, but is also driven, like [10], by the desire to enhance local communities through more sustainable less-seasonal tourist industries.

Connecting back to the beginning, it is interesting to note that Clini, et al. [4] also note how their system is also proving valuable under the restrictions of COVID 19. This is likely to be a recurrent theme where those institutions and sites that have already invested in digital materials have been better positioned for the current crisis, and thus maybe increased interest even when the current crisis has passed but when concerns about climate change and unnecessary travel persist.

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