Zelige Door on Golborne Road: Exploring the Design of a Multisensory Interface for Arts, Migration and Critical Heritage Studies

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Abstract. In this paper I discuss the multisensory digital interface and art installation *Zelige Door on Golborne Road* as part of the wider research project 'Mapping Memory Routes: Eliciting Culturally Diverse Collective Memories for Digital Archives'. The interface is conceived as a tool for capturing and displaying the living heritage of members of Moroccan migrant communities, shared through an artwork composed of a digital interactive sensorial map of Golborne Road (also known as Little Morocco), which includes physical objects related to various aspects of Moroccan culture, each requiring a different sense to be experienced (smell, taste, sight, hearing, touch). Augmented Reality (AR) and olfactory technologies have been used in the interface to superimpose pre-recorded video material and smells to the objects. As a result, the neighbourhood is represented as a living museum of cultural memories expressed in the form of artefacts, sensory stimulation and narratives of citizens living, working or visiting the area. Based on a model I developed for the multisensory installation 'Streets of...7 cities in 7 minutes', the interface was designed with Dr Mariza Dima (HCI designer), and Prof. Monica Bordegoni and Dr Marina Carulli (olfactory technology engineers/designers) to explore new methods able to elicit cultural Collective Memories through the use of multi-sensory technologies. The tool is also aimed at stimulating collective curatorial practices and democratise decision-making processes in urban planning and cultural heritage.

Keywords: User Interfaces; Sociology; Critical Heritage Studies.

1 Project Background

Tacit Heritage and Memetics

'Mapping Memory Routes: Eliciting Culturally Diverse Collective Memories for Digital Archives' is a project that aims to explore the tacit heritage of culturally diverse communities in London through an observation of the underlying socio-cultural values and practices that shape both the tangible and intangible heritage of the involved communities.[1] The interface and art installation discussed in this paper is

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[1] The first version of the project, reflecting on the need to create a digital archive of the intangible heritage of culturally diverse communities in the UK, dates back to March 2014 when I worked in consultation with academics form UCL, Goldsmiths University and Sussex University to produce a funding application on behalf of ALDATERRA Projects to Nesta, the UK global innovation foundation. See ALDATERRA Projects Company files.

aimed at creating a multisensory experience able to craft deeper connections between people and their ancestral cultural memories, positions itself with the wider research field on Community Memories [1] and new technologies for capturing and displaying intangible heritage [2].

The inspiration for the interface design comes from the practise-based artistic research I carried out over a period of 8 years for the multisensory art installation 'Streets of...7 cities in 7 minutes' [3] produced by ALDATERRA Projects and presented in 2012 in London during the Olympic Games. This project focused on the observation and extraction of specific memes (memes being the units of cultural ideas, symbols or practices transmitted from one person to another through speech, gestures and rituals) embedded in the everyday life of people historically connected by three migration journeys, the Indo-European migration, the Silk Road and the Transatlantic Slave Trade.

During my travels I configured the concept of sensorial urbanism as a 'navigation mode', a safe strategy to explore the seven cities included in the installation. The concept takes inspiration from the critical body of work on Sensorial Urbanism developed by architects, anthropologists and cultural historians such as Joseph Rykwert, David Howes, and Constance Classen increasingly shifting the predominance of the eye in urban studies towards an interdisciplinary approach embracing the whole range of sensorial phenomena and perceptual capacities [4]. The developed 'navigation mode' also draws on the power of the senses to connect to and evoke memories. As such, it was translated in the installation to enable audiences to affectively recreate lived experiences across time, connecting the past to the present through individual memory routes. Furthermore, positioning the project in the wider context of sensorial urbanism raised questions on the limited acknowledgement of the ways in which we perceive physical urban environments through the body both in city planning and public consultation processes.

Research Questions and Methodology

The evaluation report of the 2012 UK tour of 'Streets of...7 cities in 7 minutes' revealed a keen interest of members of the communities engaged in the parallel creative outreach programme 'Living Archaeology of the Place', to see video recordings of their Memory Sessions with the artist becoming an integral part of the installation [5]. They wished the installation could be more interactive on a community level, allowing more opportunities for creative engagement with the exhibited content. The challenge was how to materialise this sense of urgency into a community-curated experience with the power to negotiate notions of identity, time, presence and transmission of cultural memories as discussed during the Memory Sessions; and how to achieve this through digital interactive technologies that would also contribute to advance current debates on the use of multisensory experiences in cultural heritage studies. At the same time, I was keen to create a digital environment where people's contributions could be repurposed for the creation of a bank data of digital records related to the intangible heritage of culturally diverse communities otherwise at risk of getting lost as a result of migration, globalisation and cultural assimilation – a risk clearly stated in the 2003 UNESCO Convention on Intangible Heritage.

As I engaged in a new phase of experimentation and project development, two main research questions started to take shape. First, how can migrant communities contribute to the creation of a globally connected 'sensorial urbanism' and a broader, more socially inclusive understanding of urban spaces? Second, in which ways can the design of an interactive multisensory space engage with cultural memories and which uses can we make of it to successfully sustain democratic decision making practices in urban development and heritage studies?

With regards to the research methodology, it was clear that it had to retain the ethos and practice of the Memory Session format, which had been at the core of the 'Living Archaeology of the Place' programme. This format aimed at facilitating dialogue across groups composed of 5-10 people with direct knowledge of the place and culture they were to collectively explore. After experiencing my sensory recollection of the place through a series of stimulations including sounds, tastes, smells, objects to touch and images to see, participants were asked to share feelings, thoughts and memories of it. The ensuing conversations focused on old traditions, everyday rituals and contemporary urban life, as well as personal notions of home and cultural identity. This process of collective recollection of the body language, sounds, movements and rituals unique to the place and culture at the centre of the creative conversation, allowed the members of the group to unearth its ancestral memories as well as map out the trajectories of ancient and contemporary migration journeys forming the unique tapestry of cross-cultural migration heritage in London.[2] As remarked in the final project evaluation report, the sessions had a positive impact on the communities involved from the point of view of empowerment, intercultural exchange and cultural identity:

> By using digital media and the memory sessions, ALDATERRA Projects gives a platform and opportunity for discourse to intercultural communities to take greater control of the representation of their own histories and cultural identities. Perhaps the most exemplary areas in which true empowerment is captured is during the memory sessions which were conducted by the artist with members from the Brazilian, Chinese, Indian, Italian, Moroccan, and Portuguese communities in London. During these sessions members of these intercultural communities were asked to express the ways in which the installation relates to their own experience of city life and sense of cultural identity. By doing so, the artist uses digital recording and cyber space to create a bridge and a point of intersection where communities can take greater control of the representation of their own histories, and in so doing, move towards a future, which is empowered with a greater awareness of the necessity of cultural collaboration. So naturally "Empowerment" as a theme came up most frequently in all aspects of the qualitative research as a prominent outcome observed and experienced by participants [5].

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[2] See extracts of Memory Sessions at http://aldaterra.com/projects/the-living-archaeology-of-the-place/memory-sessions/, last accessed 2018/02/04.

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Therefore, in line with the Practice-as-Research approach of my original creative enquiry, I decided to adopt a Participatory Action Research methodology in which participants would become collaborators as well as subjects of the process of knowledge production. Workshops would be planned and facilitated to be largely community-led, and based on the principles of group consensus and agreement. More specifically, participants would undertake activities that helped them, their families and local community becoming more aware of the value of their cultural heritage and of ways of sharing it with other communities in London and beyond. They would have a personal say in what the group accomplished and the sort of tools or resources they wished to explore, so any outputs and activities would have to be customised for their local priorities and interests. Additionally, the artistic/research tool and other resources they would collaborate on would be made available to them and their community after the end of the project.

2 Design strategy and computational mechanism of the digital interface

A Strategy for Community Engagement

During the planning phase of the project, it became clear the importance of ensuring a continuity with previous research activities. Al-Hasaniya Moroccan Women's Project, is a community centre based in West London, which had been part of the 'Living Archaeology of the Place' programme and was keen to develop a collective methodological approach for the design of a digital interface that could support research and dissemination of the local intangible Moroccan heritage. Al-Hasaniya is an organization that has been active in West London over the past thirty years and, although mainly focused on women's access to mainstream support and services, promotes "greater understanding among communities"[3] and, as such, was well placed to facilitate contacts with other local groups. As the negative impact of gentrification and urban development on migrant communities was being discussed at public meetings and local residents associations, the risk of losing localised heritages as a result of families moving out of newly unaffordable neighbourhoods was also affecting people's sense of belonging and emotional attachment to the place.[4]

The importance of supporting autonomy, identity and ownership in engaging with communities has been highlighted in relevant literature [6]. Research has also revealed the importance of including local civic authorities in the design process in order to create a design space in which technologies aimed at sustaining civic engagement, are better perceived in their value, promoting trust between civic authorities and citizens [7]. In line with this, in January 2016, in collaboration with the HCI

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[3] See http://al-hasaniya.org.uk/ last accessed 4th February 2018.
[4] For an analysis of the multidimensional aspects of first generation migrants' attachment to place see Clare Rishbeth & Mark Powel (2013) Place Attachment and Memory: Landscapes of Belonging as Experienced Post-migration, Landscape Research, 38:2, pp. 160-178.

designer, we started to explore the mechanism of a digital interactive interface for which we would:

(a) Design appropriate interactions that use sensory modalities extended by digital technologies in order to augment the embodied experience;

(b) Invite the related communities to curate the exhibited content in order to strengthen the connections between the communities represented in the interface and those experiencing it.[5]

The crucial point was to create a meaningful non-hierarchical relationship between ourselves (artist, designers and researchers), and members of the communities in a multi-disciplinary project involved with the hyper-local [8]. At the same time the trans-disciplinary collaboration was aimed at devising a new design mechanism that focuses on and computationally extended the haptic, olfactory and gustatory senses to accustom people interacting with the interface with the practice of evoking ancestral memories through bodily experiences and sensory stimulation. This would help identifying appropriate ways to:

a) Engage people (as individuals/citizens/community members) with the process of surfacing, negotiating and reframing assumptions about "other" cultures;

(b) Gain a better understanding of what tactile, gustatory, and olfactory experiences can be designed for and how they can provide space for inter-cultural exchange amongst researchers, participants and general public;

(c) Design a tool that can stimulate the production of digital records from rich participants' input and collective insight to be archived and used for democratic practices in urban planning and heritage studies.

Multisensory Experience Design

Our strategy for multisensory experience design was that the focus should be first on identifying and understanding the multidimensional elements of the design space (e.g. socio-cultural, aesthetic, philosophical) and then on devising appropriate strategies for designing multi-sensory modalities. For this reason, after a long selection process I involved intergenerational members of the Making Communities Work and Grow youth centre in Golborne Road in a new series of Memory Sessions aimed at exploring cultural memories of their everyday life in relation to specific cultural objects and locations in the area. Extracts of these personal narratives were then co-curated with members of the community and used in the digital interface developed with the designer team. The interface operates in conjunction with a multi-sensory map of Golborne Road, the area in West London with the highest concentration of Moroccans living in London. The aim is to represent the street as a living museum of cultural

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[5] This section of the paper is indebted to a conference presentation prepared in collaboration with the HCI and olfactory technology designers/engineers. See Terracciano, A., Dima, M., Carulli, M., Bordegoni, M.: "Mapping Memory Routes: a multisensory interface for sensorial urbanism and critical heritage studies". In: CHI EA '17: Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems, pp. 353-356. ACM, Denver, USA (2017).

memes expressed in the form of artefacts, behaviours, smells, tastes, and narratives of citizens making up the area.

The audience physical interaction with the map takes place in direct relation with the physical objects, each requiring a different sense to be experienced and representing a different cultural meme. For example, sticks of cinnamon embody the smell of the spice used in traditional Moroccan cuisine, mainly for cakes and meat dishes, and as a traditional medicine aiding digestion. Prayer beads and a piece of fabric traditionally used in a garment called djellaba invite audiences to engage with the haptic sense to explore the meaning of such traditional cultural objects. Hidden memes embodied in the objects then resurface through gestural manipulation, as with the movement of the thumb passing through prayer beads to count religious recitations, which interestingly is common to many other cultures and religions. By picking up the objects, members of the audience are invited to engage with the geographical map and explore their own personal ancestral memories through an activation of the senses.

In addition to the manual sensorial experience assigned to each artefact, they are invited to use the *Zelige Door* (a frame containing a tablet and olfactory display) and position it on the relevant marker, which represents the object available for interaction. This action triggers the AR video of a project participant sharing a related narrative. As described in the conference paper presented at CHI 2017, "in addition to the sensorial experience assigned to each artefact, there are 30 markers distributed along the street. The markers are used by the digital interface to playback video of Moroccan people narrating stories relevant to the specific sense. We used a commercial tablet that runs an AR application able to trigger pre-recorded video sound material stored in a database and readily available in AR upon positioning the tablet camera over the marker" [9]. The videos were recorded after the Memory Sessions on green screen in order to edit them in a way that would allow the removal of the background and the processing in real time on the tablet, showing only the person talking as a virtual narrator.

It is noteworthy that at the start of the development phase we had to take the decision not to use AR SDK platforms such as Vuforia, which offered better solutions in terms of 3D object recognition, API and Could upload for videos, because the platform would automatically acquire rights on the digital content to publish. This would have been in contrast with the ethical grounds on which the project had been developed, which aimed to leave control on the final use of the digital outputs to the community. Therefore we eventually opted for the open source platform ARToolKIT, which, although less solid, did not require copyright of the digital content and was compatible with the coding developed by the olfactory designers. Indeed, to enhance the users' experience and investigate the impact of smell on memory and manual interaction, the olfactory engineers at Politecnico di Milano designed an integrated multisensory system, consisting of a frame in which multisensory devices are integrated to emit evocative fragrances in connection to specific markers. The olfactory displays consist of air cannons, based on the ultrasonic atomization method for generating fine particles of fragrances, controlled by the AR application via an Arduino board. With regards to the design of the frame, this is based on a series of aesthetic elements common in Moroccan architecture and material heritage, in which the 'zelige', as a geometric pattern, is rather common. Conceived as a door that opens on people's stories and memories from the place, the frame was developed using rapid pro-

totyping techniques, in which the various Moroccan elements are mixed together (Fig.1). Moreover, in the front part of the frame, a "Mashrabiya" inspired pattern is integrated with the zelige shape in a 'Moiré effect' (as described by the olfactory designers), creating an evocative decoration made of small holes, which allow the fragrances delivery [9]. As such the design of this digital interface resonates with Chang et al.'s work on sensorial interfaces, digital augmentations of existing physical objects through the addition of sensory mapping [10].

Fig. 1. Audience interaction with *Zelige Door on Golborne Road* during the project opening at the Rich Mix in London, March 2017. © Andrew Wasley 2017. Courtesy of ALDATERRA Projects.

3   Conclusions

In conclusion, the analysis of the digital interface explored in this paper demonstrates how the sensory experience was central to its design, being the primary channel through which memories are evoked and connected to spatial and temporal places. The creative and technical team involved with the project sought to enrich the engagement with people's memories by computationally extending the objects' information acquired through the senses and create a sensorial map that moves from the objects to the space, time and cultural significance they reflect. Therefore the integration and computational extension of the tactile, gustatory and olfactory senses togeth-

er with sound and vision underpins a design space aimed at facilitating a deeper understanding of the cultural patterns and the everyday rituals of the community involved in the project. Ultimately this was an approach aimed at creating an artistic product able to negotiate notions of identity and transmission of cultural memories, while making explicit the relationship between interaction design and people's perception. As I pointed out in relation to 'Streets of… 7 cities in 7 minutes': "the installation aims to be 'a space where the socialisation takes place', as the anthropologist David Howes would put it, or even more provocatively, where a form of 'mixophilia', borrowing Zygmunt Baumann's concept, can be temporarily established, offering visitors a glimpse of peaceful living with cultural difference, while enjoying sensorial stimulation" [11]. In this case, the collective curatorial process with the Moroccan community to select and describe cultural artefacts populating the map helped to create a direct connection with the cultural space of the participants for wider audiences. This was the a result of a consultation process that used sensorial stimulation as a channel to access people's memories and aspirations, opening up new scenarios in urban planning and critical heritage. With regards to audience interaction, touch, smell and taste act as relays of memes fostering inter-cultural exchange, enabling a deeper sense of identity and belonging, and facilitating the envisaging of utopian urban futures. Finally, by bringing together diverse yet interlaced backgrounds and experiences in areas of art, philosophy, cultural theory and techno-social design into a dialogic process, we strived to form a holistic view of a complex design space and find a common vocabulary to articulate and work on/with its different dimensions, issues and opportunities.

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