

Augmented Reality, Past – Present – Future: A Digital Humanities Project

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Abstract. Digital humanities encompass the systematic study of human experience recording through computing, allowing us to understand the past and actively engage in discussions of how the present shapes our future. In line with this premise, a research project was developed to explore how a collaborative digital humanities project contributes to re-signifying a region's immaterial legacy via utopian minds (historical figures with an idealized vision and who positively contributed to transforming their town) using augmented reality. Following the principles of citizen humanities, the project involved students, teachers, and volunteers in the research process, allowing them to collect and share memories, historical accounts, and aspirations about the place they inhabit. The participants identified utopian places and individuals, playing an active role in constructing the project's narrative. This process led to the design of a prototype of a physical-digital circuit through augmented reality. Through digital humanities, previously undocumented records were obtained, examining local history from a utopian perspective, establishing a narrative that transposes time, re-signifying the past, acting on the present and projecting the future.

Keywords: Digital Humanities, Citizen Humanities, Augmented Reality.

1 Introduction

Digital humanities encompass the systematic study of the recording of human experience through computing, allowing us to understand the past and actively participate in the discussion of how the present shapes our future. This study incorporates augmented reality and digital humanities with the aim of gathering data to catalogue, preserve, and disseminate memories to build a sustainable narrative.

By adopting a methodological approach based on citizen humanities, this participatory research delved into the exploration of values, cultural meanings, and the depth of phenomena related to local culture. It aimed to explore how a collaborative digital humanities project contributes to re-signifying a region's immaterial legacy via utopian minds (historical figures with an idealized vision and who positively contributed to

transforming their town) using augmented reality. In collaboration with the community, we identified individuals and places with utopian profiles that contributed to shaping the city's immaterial legacy.

As a result, we told local stories from a utopian perspective that integrates the past, present, and future through a physical-digital circuit. This process demonstrated how data can be used to tell multifaceted stories with significant relevance for a community. The participatory approach is also significant as it engages the participants, promoting the identification and sense of ownership of local history.

In this paper we will revise relevant literature on Digital Humanities, augmented reality and utopia studies. In the methods section, we will explain the participatory and iterative nature of the research. We present the results in section 4 and discuss their relevance in the final section.

2 Literature Review

The preservation of immaterial heritage has been a concern in several areas, given its importance as a source of cultural diversity and a guarantee of sustainable development, according to UNESCO (United Nations Educational, Scientific and Cultural Organization). As noted in the “Convention for the Safeguarding of the Intangible Cultural Heritage”, the processes of globalization and social change, while facilitating the renewal of dialogue between communities, also introduce challenges such as intolerance and threats of deterioration, disappearance, and destruction of immaterial cultural heritage (UNESCO, 2003). One of the reasons for this vulnerability is the lack of means to safeguard it.

Many authors have highlighted the role of digital humanities in preserving these memories. According to Guia et al. (2021), expanding society's contact with its memory through the digital environment enables access to various sources of collection and research. The authors emphasize that digital humanities overcome economic and geographical barriers, promoting the intersection of cultural heritage in society's daily life, which is crucial for its preservation. Strange et al. (2023) point out that the data collections dealt with in this area are objects of cultural, political, and religious importance, offering access to these topics to the general public. According to the authors, “this benefit is capable of facilitating the exchange between digital platforms that aim to share cultural narratives on a global scale” (p.6). Kirschenbaum (2012) looks at the digital humanities from a social perspective, housing networks of people working in partnership, sharing research, arguing, competing, and collaborating over the years. In fact, over the years digital humanities has been compared to a big tent (Svensson, 2012), with values of openness and collaboration (Spiro, 2012). In this context, we highlight the concept of citizen humanities, which Heinisch et al. (2021) discuss as a participatory process that values the interaction between community, citizens, and research in a collaborative and inclusive environment. According to the authors, within the humanities, citizen humanities adopt the principle of involving citizens in the activities of cultural heritage institutions and academic research. In this research, we used citizen humanities as a methodology, which was developed in partnership with the local community.

To design the narrative, we sought resources in augmented reality that would help us give shape to memories through utopian re-readings. Thus, we brought in virtual images to aid in the interpretation of the proposed reinterpretations. According to Bekele et al. (2018), augmented reality (AR) aims to improve our perception and understanding of the real world by superimposing virtual information on our view of the real world” (p.7:4). This view is shared by Azuma et al. (2001), who define AR as a “system that complements the real world with virtual (computer-generated) objects that appear to coexist in the same space as the real world” (p.34). However, the authors emphasize that augmented reality is not just limited to a specific display technology using Head-mounted display (HDM) equipment, nor is it restricted to visual perception. The system has the potential to be applied to all the senses, using various resources such as photographs, sounds and smells, and it can remove physical objects from the visual field, as well as add virtual objects. These potentialities contributed to understanding the memories that built this project’s utopian narrative.

The term “utopia” was originally coined by Thomas More in his literary work *Utopia* (1516). Premises such as collectivism and social justice characterize the utopian principles idealized by the author, who uses satire to criticize English society at the time. For Vieira (2016), this narrative is complex and has multiple layers that go beyond conventional interpretations. “The history of utopian literature is, in fact, based on different interpretations of it by generations of readers who tried to update the book’s message for their own time, reflecting on different ways of building the future” (Vieira, 2016).

Nowadays, we can hardly talk about utopia without considering the impact of the internet. According to Cowles (2009), technological advances are intrinsically linked to utopian aspirations. For the author, the internet itself is a utopia when understood as a communication platform that, besides integrating old technologies such as radio, telephone, and television, has reduced the costs of these physical structures, inspiring new technologies such as chat, instant messaging, emails, and World Wide Web pages. Analyzing the internet as a new place for relationships, Castells (2001) considers that a new social order is emerging on the planet, called the network society, built around communication networks. Within this society, the author highlights the potential for freedom that the internet provides, as well as the challenges faced, such as control and manipulation through surveillance, propaganda, and censorship. In addition, he emphasizes the loss of privacy and autonomy of users due to the power of coercion and access to private data. These issues, however, are not yet clearly present in the common sense knowledge of the Internet (Moreira et al., 2023)

Taking these concepts and aspects into account, this literature seeks to understand the impacts of a participatory digital humanities project on the re-signification of the immaterial legacy through a utopian perspective via augmented reality.

3 Methods

The research adopted an interdisciplinary methodological approach based on the research fields of digital humanities and citizen humanities, considering that our object

of investigation focuses on the cultural heritage of a community within the format of public participation. According to Heinisch et al. (2021), citizen humanities, a term that refers to citizen science in the humanities, aims to investigate questions about values, cultural significance, and the deeper meaning of phenomena related to human culture. The project actively involved the community through a partnership with a secondary school, including twenty-nine 10th grade students, two teachers, a coordinator, and volunteers who participated in the research process, sharing memories, historical accounts, and aspirations about their town. The students' participation began with the mapping of "utopian characters," identifying individuals who, motivated by the desire to create a better place to live, had an idealized and innovative vision, contributing to making their hometown the place it is today. Additionally, the participants helped establish the project's narrative, participated in the experimentation with the augmented reality system, and contributed to the design of the physical-digital circuit.

Participation in this research was conditioned on prior authorization, obtained through an informed consent form. During the interviews conducted, respect for the confidentiality of participants who desired it was ensured, avoiding any unauthorized disclosure. All materials provided by public and/or private institutions were properly identified and used in accordance with the rules established by the institutions, avoiding any copyright infringement or improper use.

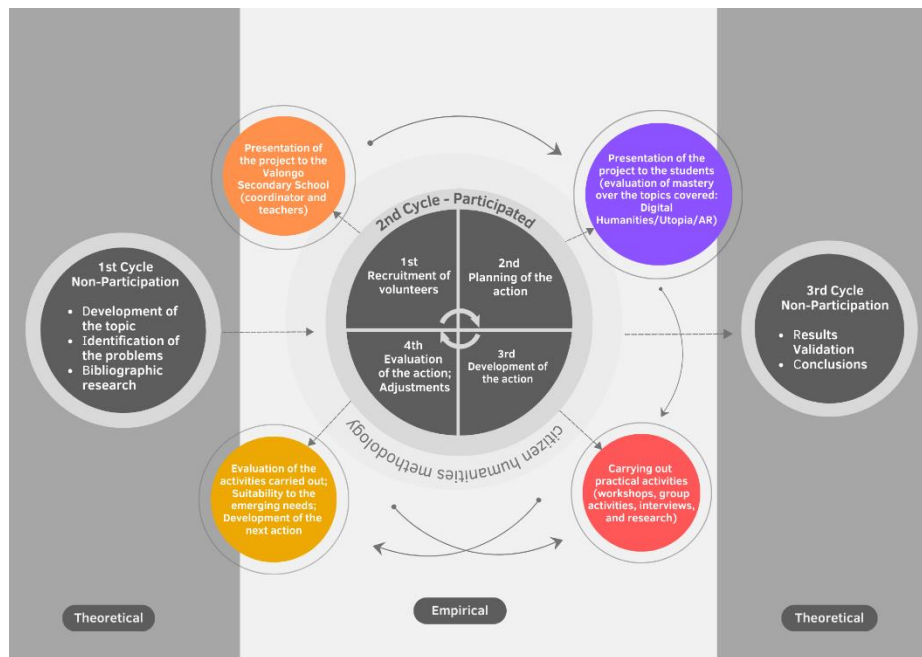


Fig. 1. Research Phases - Participatory and Non-Participatory Cycle (Created by the author).

The investigation was conducted in three cycles, each with different stages, as detailed in Figure 1. The first cycle consisted of elaborating on the theme, identifying the

research question, and conducting exploratory research that comprised the literature review. This research was based on the central themes: digital humanities, augmented reality, and utopian studies. The second cycle was responsible for attracting participants, presenting the project and initiating the practical activities. These activities included collecting memories, exploring and recording materials, re-significations (re-readings with a utopian approach), and designing the physical-digital circuit. At this stage, we observed the participants' involvement, allowing us to assess the development of the theoretical concept and the link established with the cultural memories accessed throughout the project. Through the adoption of citizen humanities, it was possible to establish cooperation between the researcher and participants and to promote dialogue between different generations. The third and final cycle aimed to validate the results of each phase of the project, reflect on the methodology applied and evaluate the results achieved at the end of the research in order to answer the research question.

For the augmented reality implementation, various applications were evaluated, including Adobe Aero, EyeJack, and Zapworks Studio. However, Artivive proved to be the most suitable for our needs, due to its ease of use, low mobile data and battery consumption, and a satisfactory free version.

4 Results

From the analysis of the various activities carried out throughout the project, including workshops held at the school, document research, fieldwork, interviews, unstructured visits, and focus groups, we have identified the following main themes:

- Mapping of utopian figures and places;
- Re-signification of the past through augmented reality;
- Valorization of the intangible legacy through the connection with local history;
- Perception of local identity;
- Projections for the present and future;
- Design of the physical-digital circuit.

The “mapping of utopian figures and places,” was fundamental to establishing the narrative of this research. This mapping started with searching for street names and was further developed by consulting documents, websites, books, and interviews, resulting in a dossier. Within this theme, digital humanities play a pivotal role, allowing oral histories and memories to be recorded digitally, gaining a voice and being eternalized.

The “re-signification of the past through augmented reality” was the result of an exercise that brought historical figures and places into the present, conducted in partnership with students during the workshops. This reinterpretation gave new life and meaning to elements of the city, such as the Volunteer Firefighters building, which was symbolically transformed into the Ministry of Finance.

Taking into account the research, the participants began to partake in the process of building the town's intangible legacy. Through re-signification, they connected with

the individuals and places, highlighting the “valorization of the intangible legacy through the connection with local history”. During the focus group with the students, when asked if the project had given them a new vision of their town, they all emphatically agreed. They emphasized that they had never stopped to think about these people and observe these places.

The “perception of local identity” came about as the students and other participants became more deeply involved with the history and heritage of the place, recognizing the local identity through a utopian perspective. For instance, by mapping the certain utopian figures, they observed common traits among these citizens who had dedicated themselves intensely to the development of their hometown. In the focus group with the teachers, one participant highlighted augmented reality’s role in rescuing identity. According to them, technology has helped to bring the past into the present: “You have a generation that is recovering the past and with it the identity of a locality and a territory.”

The “projections for the present and future” were possible by imaginative exercises in which the students brought places and figures into the present with a utopian approach. This process allowed them to creatively explore future possibilities, promoting a new vision of the city. Augmented reality was employed to assist in visualizing these projections, as illustrated in Figure 2, which shows an example of the Artivive app. The following image depicts the town’s square in the 1940s and its future projection as envisioned by the students.

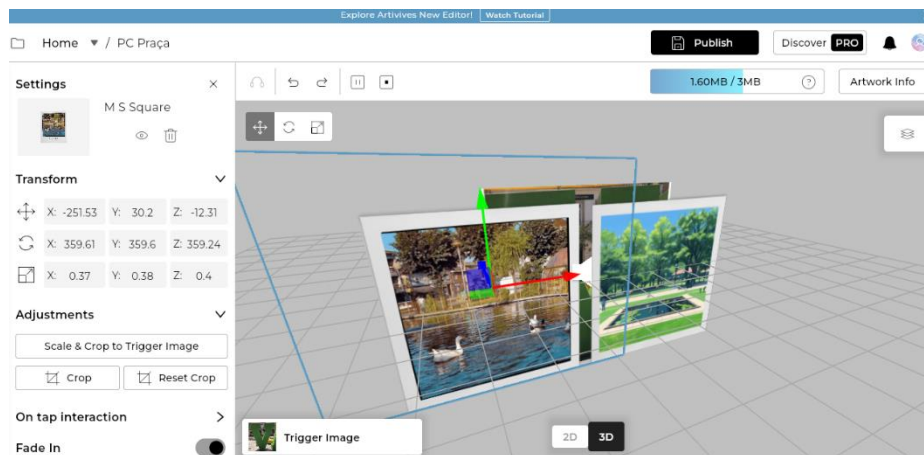


Fig. 2. Augmented Reality Projection of the town’s square (Artivive App)

This result was highlighted in the focus group: “It was the construction of an extrapolative narrative. Here you have the younger generation appropriating the past and also projecting it into the future because they also had the opportunity to transform things into future spaces.”

The final result was the “conception of the physical-digital circuit”. Through it, we promoted the participants’ engagement and autonomy, which are essential characteristics of the methodology we adopted. In a participatory approach, students, facilitators,

participants, and the community are co-creators, playing an active role in constructing the project's narrative, which resulted in the prototype of a physical-digital circuit.

The results presented, both tangible and intangible, reflect collective and deep work. Through the various activities, we were able to engage the participants in the concepts and connect them to local history through the re-significations of its spaces and figures. The creation of the physical-digital circuit offers an immersive experience that combines past, present, and future.

5 Discussion

The project allowed us, among other things, to look at a town's legacy from a utopian perspective. The dossier, built through the contributions of many, brought the story of individuals who desired to develop their hometown, surpassing the constraints of their contemporary reality. For Levitas (1990), this motivation can be explained by the fact that utopia is based on human desire, which, through hope, allows itself to oppose real historical conditions. When we look to the past and understand a place was built by utopian minds who longed for a better place for themselves and their community, we find in the utopian discursiveness proposed by Vieira (2016) ways of organizing our reflections, providing us with tools to propose changes and build a better future.

To work with these materials and preserve the oral memories obtained, we applied concepts from digital humanities, which, according to Rollo (2019), make it possible to expand the universe of content in order to preserve it for future generations. In this sense, we comprehended the project's importance in recording the memories of local residents. The resignifications were rendered by augmented reality due to its ability to superimpose images – a potential emphasized by Azuma et al. (2001) in the simultaneous interaction of the real world and virtual objects. These renewed meanings assigned to the history of a place is not accomplished by the final product but by the participatory process cycle.

The perception and appropriation of one's own identity occurred as the participants delved deeper into the stories and felt comfortable deconstructing characters and places. This work was possible due to the relationships established between the groups and through shared activities. Kirschenbaum (2012) highlights collaborative work through the creation of networks of people as one of the social aspects of digital humanities. From a methodological perspective, we draw attention to the role of citizen humanities, which, according to Heinisch et al. (2021), values the interaction between community, citizens, and research in a collaborative and inclusive environment.

Upon examining the research question, we realize that through digital humanities, we obtained previously undocumented records, observing local history from a utopian perspective, depicting figures driven by the desire and hope to improve their community. This process established a narrative capable of transposing time, bringing the past into the present, and re-signifying the future with the support of augmented reality. As a result, we found that the collaborative network formed engaged the participants, promoting the identification and sense of ownership of local history.

In the future, we aim to continue working with the community to map Valongo's utopian minds and places and develop the physical-digital circuit, making it available for the citizens and the tourists. We also aim to implement the approach in other locals, namely, in Brazil, which will allow us to gain more insights into digital humanities participatory projects.

References

1. Azuma, R. et al.: Recent Advances in Augmented Reality. *IEEE Computer Graphics and Applications*, 34–47 (2001).
2. Bekele, M. K., et al.: A Survey of Augmented, Virtual, and Mixed Reality for Cultural Heritage. *ACM Journal on Computing and Cultural Heritage* 11(2), 7:1–7:36 (2018).
3. Castells, M.: *A Galáxia da Internet: Reflexões sobre a internet, os negócios e a sociedade*. Editora Zahar, Rio de Janeiro (2011).
4. Cowles, J.: The Internet as Utopia: Reality, Virtuality, and Politics. *Oshkosh Scholar. Oshkosh Schola* 4, 81–89 (2009).
5. Guia, M. O. V. da, et al.: Humanidades digitais: conceitos e origem. *Digitales PublicAAHD* 2, 1–12 (2021).
6. Heinisch, B., et al.: Citizen Humanities. In: K. Vohland et al. (eds.) *The Science of Citizen Science*, pp. 97–118, (2021).
7. Kirschenbaum, M.: What Is Digital Humanities and What's It Doing in English Departments? In: M. G. (ed.) *Debates in the Digital Humanities*, pp. 3–11 (2012).
8. Levitas, R.: *The Concept of Utopia*. Peter Lang, Lausanne (1990).
9. Rollo, M. F.: Desafios e responsabilidades das humanidades digitais: preservar a memória, valorizar o patrimônio, promover e disseminar o conhecimento. *O programa Memória para Todos. Revista Estudos Históricos* 33(69), 19–44 (2019).
10. Strange, D., et al.: Equality, findability, sustainability: the challenges and rewards of open digital humanities data. *International Journal of Performance Arts and Digital Media*, 1-21 (2023).
11. Unesco – Convenção para a Salvaguarda do Patrimônio Cultural Imaterial, https://unesdoc.unesco.org/ark:/48223/pf0000132540_por.locale=en, last accessed 29/07/24.
12. Vieira, F.: The four modes of thinking framed by utopian discursivity; Or why we need Utopia. In: Monteiro, M., et al. (eds.) *Utopia(s) - Worlds and Frontiers of the Imaginary*, pp. 9–24 (2016).