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Expanding realities: AI and XR in the future of documentary and memory work

We are witnessing the expansion of the formerly linear storytelling genre into non-linear narratives making leverage of new technologies such as virtual reality (VR) and artificial intelligence (AI). These technologies are transforming how we document, preserve and engage with memory work and cultural heritage.

Unlike traditional media, VR is not just viewed but inhabited. Jaron Lanier (2017) conceptualizes VR as an embodied medium "in which interactive biological motion is emphasized" (p.173). VR fosters presence,[1] immersion,[2] embodiment[3] and interaction.[4] These factors, combined with storytelling and gamification mechanics (challenges, rewards etc.), position the user as the hero in non-linear, often time-fluid narratives – journeys that merge past, present and future. These user journeys are being experienced, lived and thus memorized; they serve as "digital implementations of memory palaces" (ibid, p.220) and they can also serve as embodied interactions with avatars created from a plethora of archives. AI plays a pivotal role regarding the interactive design of these experiences. Generative AI tools can create historical avatars through 3D visual reconstruction and voice synthesis, whereas natural language processing tools enable users to have an in-depth conversation with them. The avatars embody and become "living archives" (Benoit et al., 2019).

For instance, the VR experience *Chomsky vs. Chomsky: First Encounter* (dir. Sandra Rodriguez, 2020) which I collaborated on was one of the first experiences using these AI technologies. Already in 2019, we were able to build our prototype on four sets of technology: a chatbot system with branching Q&A Maker in Microsoft Azure Services, an

1 Because there are ample conceptualizations of presence, I mention only the ones important for this discussion: as social richness, as realism and as the sensation of being there (Lombard & Ditton, 1997).

2 Perceptual immersion, "the degree to which a virtual environment submerges the perceptual system of the user" (Biocca & Delaney, 1995, p. 57).

3 It gives us "a feeling of having or experiencing a body" (Palma Stade et al., 2023, p. 234).

4 The user's agency within the story world.

intent analysis AI system (LUIS – Microsoft Azure Services), a complex conversational machine-learning AI (BERT), and a speech-to-text and text-to-speech software using a deep faked voice. The data library used to feed the conversation draws from 5,000 questions and 6,000 answers taken from the public domain Chomsky.Info. Like all conversational AI at that time (2019), the back-end system was also highly scripted. We created a robust system where Chomsky_AI "listened" to users' questions (speech-to-text). It then used an algorithm to predict the question's intent and content (LUIS), and then decided which of the three conversational AI nodes to choose suitable answers from. The AI system finally responded by transforming text answers to speech, and emulating a Chomsky-like voice (deep fake). Not only did the users help train the AI with their interaction, but through using their tone of voice, questions and audio inputs, they co-created a unique sound environment and musical score via an algorithmic mechanism making the piece into a living-and-breathing embodied archival experience.

However, there are many ethical issues to be considered when creating these participatory and living archives. Because of VR's immersive and embodied aspects, alienation aspects should be introduced, so that the user is made aware they are inside a constructed world, prompting critical reflection on how history is framed and experienced. In this way, VR can encourage users not just to witness, but to interrogate history. Moreover, authenticity and representation also become central questions (Madary & Metzinger, 2016) as well as superrealism (Slater et al., 2020). Is the historical figure based on authentic data or reconstructed bias? What happens when AI fills in the gaps in archival evidence?

Furthermore, consent and data privacy must be addressed, especially when VR experiences are built on user interaction data or AI-trained on crowd-sourced archives.

These technologies invite a shift from static documentation to living, participatory archives: places where history is not just preserved, but continually reimagined through interaction.

All in all, we must commit equally to ethical, inclusive and critically informed design. In doing so, documentary can evolve into a multidimensional space where memory, technology and imagination meet.

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