A Poor Woman's Interactive Remake of the "I Still Remember" Documentary with OpenGL

Miao Song¹, Peter Grogono¹, Jason Lewis¹, and Maureen J. Simmonds²

¹ Concordia University, Montreal, Canada

² University of Texas Health Science Center at San Antonio, USA

Abstract. Making the "I Still Remember" documentary's memory floating bubbles interactive with audience's participation using a near day-to-day OpenGL (aimed at later enhancements with haptics). We describe a simple process of making a passive documentary interactive using available tools and preserving the aesthetic and emotional appeal. Moreover, the good comparison of the linear convention film and its nonlinear narrative version with audiences' body movement involvement may give answers to some of the artists who are still hesitating to adapt their projects to the dramatic developed new technology.

Keywords: interactive documentaries, computer graphics, HCI, OpenGL.

1 Introduction

We briefly review the related work and literature on various topics of interactive cinema, documentary, and our position about it as well as new media and interaction research in cinema, and documentary in general. We then describe the methodology of application of some very common computer graphics tools and techniques to make a passive documentary "I Still Remember" [10] interactive in Section 2 as a work in progress. We then conclude with limitations of our approach and the immediate future work in Section 3.

Interactive cinema. A complete research overview on the evolution of cinema in general, modern digital art (to 2003), and specifically including the interaction aspects are well described in [8]. Some of the interactive elements that make the cinema 4D or 5D include unior bi-directional physical and sensory touch via touch screens, joysticks, Wii-like devices, and force feedback devices, such as haptics, moving seats, or even smell or snow fall (see "Polar Express"). 4D usually entails the virtual cinematic show affecting the real environment of the audience but the audience has no way to interact back, just react. 5D would be bi-directional, primarily with the use of motion capture and tracking, touch-, and haptic-devices. Some recent research on haptics that can be employed for interactivity in cinema is in the book [16] featuring multifaceted research chapters on devices and techniques that translate the interactions in the virtual world into real physical world with force feedback and allow the users to use the same devices to alter the virtual world again. Song et al. positioned about many related aspects in [9].

Interactive documentary. Everything has been affected by arising new technologies, newspaper, such a NYT changes from paper format to mobile or computer based. Just about the same is happening to the dynamic media and documentary production. The notion of interactive documentary has roots in traditional story telling and narrative and computer-based techniques with user-interaction, interactive TV, and computer games.

The interactive mode in documentary theory appears in the introduction of the *four modes* in documentary theory, such as expository, observational, *interactive*, and self-reflexive, as detailed in [7]. Next, Barfield discusses what interactive documentaries could be back in 2003 and the problem of narrative vs. interaction and interactive story telling with 4 main structures [2]. A very relevant description of technical and non-technical sides of making an interactive archive by a brother of a person with the degrading Usher syndrome (who can't hear or see any longer) who made home-shot family audio/video footage spanning across 20 years [12]. Furthermore, Lachman presents "Diamond Road Online" (DRO) – an experimental interactive documentary system with user interface and recommendation systems to present the documentary stories (in a keyword indexed database) of diamond trade allowing semantic links between clips to make a continuous story off those clips [4]. Another recent article details the production process of the documentary "A Golden Age" in England as an interactive configurable documentary (interactive narrative) and the use of the "ShapeShifting Media" technology with the technical implementation details and the Narrative Structure Language (NSL) [14].

Then there is also a similar shift in education and drama portrayal. A recent book [1] describes drama teaching using computer games with the intent to make a memorable learning experience in a simulated environment including the documentation of the research and practice of the approach. And, in the journal article [11] the authors implement an interactive drama engine (IDE) based on theoretical foundations of narratives and drama as well as practicality and interactivity of 3D first-person fiction/adventure/etc. games where participants can deeply affect the story line unlike in traditional games no documentaries. The most recent items and developments discuss newer web-based and database-driven technologies for digital storytelling [15] such as the Highrise documentary film "Out My Window" [3], and also open-source software systems, such as Korsakow [13] in Java to build one own's documentaries in tree-like structure.

2 Methodology

Augmenting and expanding the "I Still Remember" short film with interaction and projection of the memory bubbles. What could it be and the necessities of introducing interactive media technology to traditional documentary film making? The research could be a long journey as witnessed by some of the items in Section 1, but we take a small step at a time.

"Mostly, the memories are like little pictures in my head, like float around in the bubbles... So, when I want to see them, I search all those bubbles... Then I go into one, I can remember them..."

We would like to visualize the idea into a real touchable interactive installation. The prototype is the augmenting the “I Still Remember” short film with interaction and projection of the memory bubbles. This runnable simple program we have developed in OpenGL to demonstrate how the 3D bubbles floating randomly in the space. Each of them will contain a piece of memory, and project the bubbles will on the environment surfaces, such as walls. What makes an interactive installation documentary piece different from a traditional documentary is the aspect of interactivity itself and the audience being able to compose their preferred pathways and storylines selectively, bidirectionally, with ability to go into details of interesting points to them unlike a linear passive progression. In the advanced way, the interaction can be also immersive and bidirectional with haptics and virtual reality techniques. The resulting “artistic high-level algorithm” :

1. The media represent memories of home videos, photos, audio, and animated texts [5].
2. Each bubble has a unique color, which presents the emotion level of memories, such as brightness and sadness.
3. Audience is allowed to interact with the bubbles, and the bubbles’ motion and collision response are to be based on the behavior and gestures of audience. The effects of bubbles could be soap bubble bursting, softbody dynamics, and rigid body sparkling collision. (In this work, we limit this step to interaction by the audience using only mouse clicks in an OpenGL window to bring a bubble of choice or to move a synthetic camera in that environment with a keyboard).

Modeling. We model each bubble object in the first iteration as a translucent sphere with a flat polygon inside, procedurally. The polygon is a 2-sided quad onto which a texture photograph can be mapped, or a text item with or without animation, or more generally a video clip [6], all of which are done via OpenGL. Each bubble is defined by the property of the contained media and the outer color. Of course the bubbles also have a radius and a position. A more advanced ball modeling under consideration in utilization of the softbody objects instead of plain spheres to add realism and tangeability. The amount of bubbles and their content is determined presently via a preset set of content in the code constant, but is planned to be dynamic.

Interaction. The present level of interactivity by the audience is via simple mouse clicks the 2D coordinates of which are then translated to the nearest bubble, which is then “selected” and zooms in slowly onto the viewer with its content gradually taking over the full screen in which the corresponding media content (photograph, text, video clip) is rendered (see Figure 1(b)). Clicking the zoomed-in content makes it recede back to the bubble pool of memories. For the video clip-based bubbles on zoom-in the sound is also activated. The sound may also optionally be activated on textual and photo bubbles if it is present in a form of narration. More advanced interactivity is planned with haptics and camera-marker motion capture or a Wii.

(a) Bubbles Float with Screen Media Inside Them

(b) A Close Up Example of a Selected Bubble with a Video Content Playing

Fig. 1. Example renderings of the Memory Bubbles Containing Videos and Static Photos

Projection. The installation is *planned* to be projected in a black box or an enclosed room alike. An option is planned for the projection to be stereoscopic. Another projection option is the 180-degree screen VR system that we are considering.

3 Conclusion

We presented our initial “poor woman”’s way approaching an interactive documentary work-in-progress with a widely available OpenGL library and a set of online open available resources to play clips, texts, and images from a passive storyline documentary into making it interactive. The memory bubbles concept came from the content of the original documentary itself of a little girl describing her own memories as floating bubbles she could pick and “see inside” if she wanted to remember something. The working interactive prototype features 5 bubbles with 3 videos and 2 images as illustrated in sample screenshots in Figure 1(a) and in Figure 1(b).

Current limitations. Current limitations that plague interactivity in the documentaries, specifically a profound difficulty to for multiple people to interact with the same documentary piece instance at the same time is problematic (e.g. one would need to support multi-input in a form of multiple mice, keyboards, haptic devices, cameras or motion tracking sensors from more than one individual from the same audience in the same space-time. Our specific documentary’s evolution is also impacted by the general limitations described in the preceding paragraph, but also has its specific limitations related to the technological limits on content quality, dimensions, and the scale that can be played at simultaneously. It is also hardware-dependent. Another aspect is that the bubbles float in 3D space, but the basic mouse interaction is 2D and clicks have to be translated to the bubbles nearest in the z dimension, which sometimes is confusing when x and y are near for two or more bubbles, and the user wants one bubble, but gets another one instead to view.

Future work. “Rich woman”’s augmented and expanded interactive documentary installation immersive and tangible experience will include the following items: 1.

Research on and address the limitations in some way 2. Haptic connectivity 3. Softbody balls 4. Interactive installation 5. Black box and VR projection installation 6. Stereoscopic 7. Database-driven.

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