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Examples of documentary work with VR technology: *The Lost Time*, and *For real?*

In 2021 the Film University Babelsberg KONRAD WOLF recorded its first volumetric interview. As a much-decorated honorary citizen of Berlin, the interviewee Margot Friedländer was a known and respected figure. At the time of the interview, she was just a few weeks short of her 100th birthday, passing away in 2025 at the age of 103. Her death highlights yet again a question crucial not only for specialists in remembrance work but also for German society at large: what do we do when there is nobody left who can speak first-hand about the Holocaust?

Volumetric capture, or the 3D representation of live action footage in a virtual space, has been around for about ten years. The technology however is still in its infancy and often contains artifacts that prevent hair, ears or hands from displaying a photo-realistic quality. While a volumetric video appears lifelike and directly filmed, it also reveals traces of its production process. The Film University's projects with Holocaust survivors have therefore always been accompanied by the question of whether one can justify the use of this technology to document survivor experiences for future generations.

Launch of volumetric interviews with Margot Friedländer

When Christian Zipfel, the artistic director of the volumetric archive at the Film University, visited Margot Friedländer for the first time at her home, she proudly showed him the countless letters she had received from pupils over the years. He spent three hours reading them – it was important to Margot Friedländer that Zipfel gained a comprehensive idea of the pupils' responses. Zipfel and Friedländer then discussed the possibility of her being the subject of a three-dimensional video. At this point, it was unclear whether the 99-year-old Frau Friedländer had grasped the nature of this type of digitization as Zipfel found it hard to explain the proposal without using such technical concepts as virtual reality, volumetric data and photogrammetry. Margot Friedländer eventually agreed, but the team was not entirely sure whether this was because she recognized the potential scope

and impact of the project or whether she was persuaded by Zipfel's enthusiasm. But regardless, her position was: "Everything that helps has to be done."

The interview with Margot Friedländer was the first in a series of currently 22 interviews with Holocaust survivors, which include the protagonists of the *For real?* project. At the Volucap studio in Potsdam-Babelsberg, individuals are filmed by 36 cameras simultaneously from every conceivable angle, which yields a complete three-dimensional image. Each minute, the cameras generate enough data to fill 100 BluRay discs and the available storage capacity therefore limited the interview to an hour. These recordings were essential to our project for another reason: by saving the raw image data in the best possible quality, we ensured that the resulting volumetric video could be created with the most up-to-date technology. As this technology develops, completely lifelike videos located in a variety of virtual spaces may be generated from this data. This possibility can thus secure the future of such video archives and will enable schools, institutions and museums to use 3D data in their educational efforts.

The Friedländer interviews

For the actual interview with Margot Friedländer, time was a challenge. Christian Zipfel had to trace a tight narrative arc in the single hour of filming while also meeting the expectations of the interviewee, and he and Friedländer discussed the content intensively in advance. Zipfel was interested not only in the story Friedländer was accustomed to telling in her visits to classrooms, but also in her relationships with family members she had lost in the Holocaust: a concrete family history helps listeners develop empathy.

Processing the images from 36 camera perspectives into a 3D representation is no easy matter and is susceptible to various types of error. Clothing and make-up must be chosen or adapted to show large uniform surfaces and prevent light from reflecting. In simple terms, the algorithm takes a handful of overlapping images from different perspectives and searches for matching patterns. Depth values are assigned based on how a given point in the image moves against the background between two perspectives. The farther a point moves, the closer it is to us.¹

1 Readers can test this on themselves if desired: Extend your arm with the thumb pointing up and close first your left and then your right eye. Move your thumb closer to your eyes and try again: How does the position of your thumb change with respect to the background? This parallax effect is a key component of human depth

Friedländer had worked in New York as a seamstress and had clear ideas about what her three-dimensional recording should look like, given that it would be available to future generations and would outlive her. It was not easy to give a 99-year-old fashion advice based on the requirements of an algorithm. It was especially hard with one particular accessory, namely her mother's amber necklace, which was of great narrative and emotional significance for her story. She had to remove the necklace for the 3D interview as the shiny amber reflected the light, which would have made it appear white and thus invisible in the 3D film. However, the team added the necklace later as a 3D object.

The interviews were conceived as 3D documentary films. No interaction with the protagonists was intended, nor was any AI-supported post-processing. The data showed what Margot Friedländer and the other interviewees said on a specific day – no more and no less.² It is often noted that the lack of perfection in many volumetric documentary videos may give them a sense of authenticity sometimes lacking in fictional/staged productions. Despite the comprehensive calculations involved in their creation, the final 3D look has a certain unprocessed and direct quality.

In order to turn these 3D interviews into VR experiences functioning as walk-through documentary films in terms of both content and emotion, we needed to select a setting. We chose different and contrasting approaches for *The Lost Time* and *For real?*

VR experience in the project *The Lost Time*

In *The Lost Time* (German title: *Die wenige Zeit*) viewers encounter Margot Friedländer in a schoolroom – in real life she often told her story in schools.

One key ethical question for the team was whether she could be placed in a digitally reconstructed concentration camp in order to dra-

perception with binocular vision, as well as the basis for photogrammetry (reconstruction of 3D objects from a large number of photos taken from different perspectives). Applying photogrammetry to a temporal sequence of images is known as volumetric capture and yields a “walk-through” video.

- 2 Twenty individuals have been interviewed for the volumetric archive of Holocaust survivors: Margot Friedländer, Kurt Hillmann, Franz and Petra Michalski, Inge Auerbacher (twice), Ruth Winkelmann, Rahel Mann, Thomas Walther, Wendelgard von Staden, Charlotte Knobloch, Ib Katznelson, Alodia Witaszek-Napierała, Leon Weintraub (twice), Eva Szepesi, Gidon Lev, Helena and Harry Schanzer, Tova Friedmann, Andy Sarkany, Pina Frassinetti Wax.

matize the VR experience. Here the decision was quick and clear: the idea was not pursued on the basis that this may have seemed like a new, digital deportation. Under the art direction of Evgeny Kalachikhin, photogrammetric techniques were used to create various historical spaces from the Theresienstadt concentration camp and ghetto. Three-dimensional images of a room were calculated from hundreds of photos taken from various perspectives. Classical photogrammetry requires considerable manual post-processing but also displays a high degree of authenticity: every crack in the floor of a Theresienstadt barrack can be documented because it still exists today. The rooms were then historicized with manually-modelled 3D objects, using drawings made by survivors of Theresienstadt. Viewers can enter these rooms in the VR experience, but the rooms are separate from the 3D image of Margot Friedländer, whose voice-over provides context. Her voice guides visitors through the 3D documentary and her words fill the rooms – she herself is visible only in the safe space of the schoolroom.

The VR experience affects viewers to different degrees. Margot Friedländer's reaction was positive but she had a concrete critique. "It's very well done," she said, "but that's not what it looked like. Where are all the dead bodies, where are the prisoners, why don't you show them? They were there, I saw them." Christian Zipfel tried to explain the underlying artistic considerations, namely that her account of the murdered people would be heard as a voice-over, but that did not fully satisfy Friedländer.

The insight to be gained here is that the moral standards applied to VR experiences vary widely. Some viewers could not look at the VR rooms because they triggered too many emotions. Others found them boring, because nothing happened in them apart from the voice of Margot Friedländer. *The Lost Time* is a VR experience that explores the artistic limits of showing the Holocaust in virtual reality.

VR experience in the project *For real?* based on the new 3D archive

Under the direction of Professor Björn Stockleben, the Film University Babelsberg KONRAD WOLF has built up a volumetric archive of interviews with 20 Holocaust survivors. As a pilot case for opening up the 3D archive for projects with third parties, the Film University's teams with Professor Björn Stockleben, Christian Zipfel and Evgeny Kalachikhin, together with the Brandenburg Museum's Dr. Katalin Krasznahorkai, Johanna Schüller and Dr. Wenke Wegner, jointly developed a way of expanding the educational potential of the archival material for

a young audience. This is what led to the second VR experience: *For real? Virtual encounters with Holocaust survivors*. This project was conceived jointly by outreach and educational specialists, cultural historians and film experts.

Its setting is considerably more austere than that in *The Lost Time* and avoids all forms of emotionalization. With a focus on the spoken word, Holocaust survivors sit or stand in a white room with a similar visual appearance to the room in which the original recordings were made. Each answered ten questions which a school group from Potsdam proposed as especially relevant, and which were then adapted to fit the educational concept and mobile exhibition. This artistic and curatorial decision produced a setting stripped of distractions, and which lends documentary authenticity to the survivors' stories.

The *For real?* project elicited many comments and questions about the specifics of the 3D interview situation. Only the person being recorded could actually be in the film studio, which meant that the questions were posed over a loudspeaker – the interviewee could hear the questions but not see the questioner. The interviewees quickly became accustomed to this unusual situation, with some notable exceptions. The Holocaust survivor Rahel Mann refused to sit alone in the room, due to her traumatic history which included years of hiding alone in a cellar. For this reason, artistic director Christian Zipfel can be seen accompanying her in this recording.

Survivor Kurt Hillmann reacted to the recording situation completely differently and in a very emotional way, noting afterwards, “It was as if I was speaking into a white night.” He described his volumetric interview as “the most intense impression you can have of someone telling you what they experienced”. Spatial configurations and relationships lend an immediate sense of presence – the experience is intuitive and body language can be perceived directly.

Such experiences can increase the potential for empathy (see Tummescheit, Stockleben and Yurtaeva-Martens in this volume), yet at the same time there are limitations. Even if viewers embrace the perspective of the interviewee, they lack the context for an authentic experience. Participants in the VR experience, with their individual and differentiated backgrounds, remain inhabitants of the 21st century visiting an exhibition; they generally do not have comparable experiences of ostracism and flight, and advances in VR technology will not change this. Those who take this challenge into account, however, will find virtual reality to be a multifaceted medium whose potential in the documentary context offers much for future exploration.



Fig.1: Margot Friedländer with Christian Zipfel, October 2021 (© Evgeny Kalachnikhin / Film University Babelsberg KONRAD WOLF)



Fig.2: Alodia Witaszek-Napierata prepares for the recording at Volucap, December 2022 (© Jakob Grاسبöck / Film University Babelsberg KONRAD WOLF)



Fig.3: View of work at the Volucap studio in Potsdam Babelsberg, May 2022 (© Jakob Grاسبöck / Film University Babelsberg KONRAD WOLF)

Christian Zipfel, filmmaker and media artist, studied directing at the Internationale Filmschule Köln (ifs) and the Film University Babelsberg KONRAD WOLF. Films shown at e.g. the 75th Venice International Film Festival (*ROOMS*) and the 39th Warsaw Film Festival (*The Soil of the Namib: Dreams*). Wim Wenders fellowship in 2020. Since 2021 artistic director of the project Volumetric Contemporary Testimony of Holocaust Survivors at the Film University Babelsberg KONRAD WOLF.

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