

Digital Video in Digital Humanities Methodology: A Case Study

Aleš Vaupotič,^{*} Marco Buziol,[†] Narvika Bovcon[‡]

^{*} Research Centre for Humanities, University of Nova Gorica
Vipavska cesta 13, SI-5000 Nova Gorica
ales.vaupotic@ung.si

[†] Academy of Fine Arts, Venice
Dorsoduro, 423, 30123 Venezia, Italy
accaquattro@libero.it

[‡] Faculty of Computer and Information Science, University of Ljubljana
Večna pot 113, SI-1000 Ljubljana
narvika.bovcon@fri.uni-lj.si

Abstract

The paper presents a digital reconstruction of the building that hosts the new headquarters of the Academy of Fine Arts in Venice as a digital humanities methodology case study. The building has been appropriated for different functions throughout history, from being a hospital for incurables to an orphanage. Recently the space was re-functioned for the studios of the Art Academy. In the project we have integrated multifaceted information about the different stages of the building's use in the medium of digital animation. Finally, the digital 3-D model was used for exhibiting contemporary art works by students of the Academy and videos by artists from the Society for Connecting Art and Science ArtNetLab.

1. Introduction

The programmatic collective monograph *Digital Humanities* (2011) starts from the idea that it is not the digital humanities as a new field that is coming to life and evolving, but that the humanities in general have changed irreversibly: “The digitization of the world’s knowledge and its movement across global networks [...] have transformed what we understand by and how we approach the humanities in the 21st century” (p. 26). The so-called second-generation digital humanities reflects on the unavoidable intertwinings of (new) communication media with existing humanities research practices. One of the main foci of the book are the “transmedia modes of argumentation” (p. 4), i.e. the non-linear and non-verbal modes of argument, which must, of course, be effective, clear, and rigorous in the use of evidence. The monograph argues for a new “form of scholarly practice; multimedia modes of argumentation that are object-based rather than discursive” (p. 33). Here “object-based” refers to the creation of new artefacts that convey meanings.

The consequence of the medial shift in scholarly practice is the necessity for combining the “perspectives of humanists, designers, and technologists” (p. 10). From the vocabulary of graphic and multimedia design many new humanities terms and formulations, sometimes refused as fashionable and jargon-laden, have been taken. However, it is clear that in the case of a multimedia argument the language of video is the encompassing semiotic framework: it extends the possibilities of film language into the pre-montage cinema and into the motion graphics paradigm which, as a rule, combines the moving pictures with graphic elements, usually animated—in all of these cases the film space emerging from the montage of shots is missing, the surface in motion, in combination with sound and other communication channels, is the medium.

2. The goal of the project

The task of this paper is to present a concrete example of argumentation not tied to the verbal language. We maintain that it is necessary to realise pilot projects that embody concrete solutions—thereby facilitating critical reflection—and that, at least in the current moment, it would be extremely difficult and risky to develop the grammar of transmedia modes of argumentation in isolation from practical prototyping. The design process and its result offer deep insight into the practices of humanities that are useful in a digital environment. The paper presents in detail the visual argument for presenting a historical diachrony in a geolocation in the medium of digital animation.

The aim of our experimental project was a digital reconstruction of the new (since 2004) location of the Venice Fine Arts Academy at Dorsoduro and a presentation of its diverse functions through centuries in a digital animation. Originally, the building was the Hospital for Incurables, from about 1550 till 1807, and the courtyard, now a vast open space, was the site of a pilgrimage church. In the next period, from 1807 till 1819, the building was a regular hospital of Venice, and the ground floor was used for housing patients, the first floor for orphans. The church was famous for concerts of classical music that attracted numerous visitors and were the source of financing for the operation of the hospital. In the years 1819-1934 the building was transformed into military barracks, and in this context the church was demolished in 1831. Afterwards the building was transformed and used as a Centre for the Rehabilitation of Minors (1938-1977).

3. Gathering of historical information, and reference photos and videos

The first step of the project was gathering the historical information and visual reference materials about the building that we planned to recreate digitally. A visit to the CIRCE Cartography Lab of the University IUAV of

Venice was essential, since they provided us with architectural plans of the building as it exists today after the renovation works. We used the blue-prints in 3-D modeling. The visit to the library of the Academy of Fine Art of Venice disclosed further interesting historical facts and additional floor plans. The book *La Nuova Accademia di Belle Arti di Venezia* edited by Renata Codello (2011) documents the period when the building was transformed and used as a Center for the Rehabilitation of Minors. The inscription on a building wall documented on a photograph pointed us in the direction of looking for more inscriptions about the historical facts and dates, such as the inscription board marking the old pharmacy or a date carved in stone in roman numbers on one of the four wells in the courtyard. We recreated these inscriptions in the digital model and used them as corner-stones of our visual narrative on the building's history.

The next step was the visit to the Academy premises in order to collect contemporary reference photos and videos. For modelling of a digital object it is necessary to collect many high quality reference photographs and videos to understand its shape, the proportions of the object and its position in space. The photographs are used also for achieving the correct visual result when we work on textures, materials, lighting and rendering algorithms, and as image sources that are enhanced in Photoshop software and applied to the model as textures.

The movement of the camera was animated with great care, since its function was also to evoke the atmosphere of the ambient, the memory of e.g. riding a vaporetto or walking under colonnades, to build suspense and to communicate emotions. The visit to the actual site gave us the experience of the place, which involves the spatial relations, the light and the pace of the inhabitants' activities. The physical experience of spatial orientation, proportions and volumes, as well as light and rhythm, is recursively needed as a reference to evaluate the digital animation—as a criterion about whether the animation gives you the right “feel” of the space.

4. The structure of the visual narrative

The selection of most interesting architectural and urbanistic features guides the visual narrative, the montage, and the movements of the virtual camera. Four main parts of the building were identified—the waterfront facade, the courtyard, the church and the library (former pharmacy). Each of the architectural parts was then presented in a separate take (sometimes two takes) of the virtual camera in the digital animation. However, a fluid experience of the connected parts of the building complex had to be achieved, therefore some parts of the building reappeared throughout the animation. The angles of the camera view were carefully considered for each take.



Figure 1: Digital reconstruction of the new location of the Academy of Fine Arts in Venice at Dorsoduro. The waterfront facade from the beginning of the digital video.

The video begins with a wide shot of the waterfront that shows the facade of the Academy and the neighboring buildings, lined-up along the Canale della Giudecca, so that the viewer understands immediately that we are in Venice. The movement of the camera is animated carefully and synchronized with the waves of the canal waters—as though the viewer was approaching the Academy on a vaporetto, the water bus. The movement is relatively slow, it allows the viewer to explore the set-up (Figure 1), enjoy the details of the facade, and remember the rhythm of riding on a vaporetto; at the same time the animated take builds suspense. The camera enters the Academy through the main portal and halts as it enters the vast open space of the courtyard, surrounded by beautiful colonnades. Here is the first montage cut, in the next take the camera is animated from the point of view of a visitor who walks under the colonnades and admires the play of light and shadow cast by the columns around the sun-bathed courtyard (Figure 2). This take ends as the camera steps into the central area—after walking approximately a 90 degrees angle around the courtyard—and looks towards the entrance, through which the waters of the canal are again visible in the distance.



Figure 2: The courtyard.

The next take, in contrast to the previous ones, builds on the main characteristic of the virtual camera, i.e. it being free of any physical constraints: it jumps over the building and rotates to show the rectangular courtyard from a bird's-eye perspective view, in a very bright light under the sky. This in reality impossible camera movement is used in its first part to show fine detail such as lace-like railings, the shutters and stones on the facade (Figure 3), while towards the end of the take the now non-existent church appears in the courtyard. The camera shows it from above (Figure 4), thus revealing the bell tower and the partitioning of the remaining space of the courtyard by the corridors that connected the church to the main building at each of the four sides. There are four wells, one in each corner, they were used in case of fire, one for each partition of the courtyard.



Figure 3: Details on the facade.

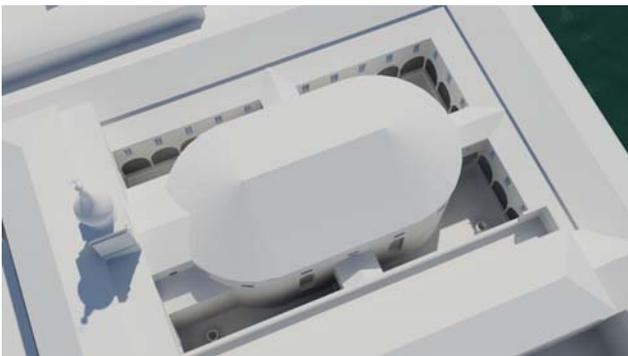


Figure 4: The church of the Hospital of Incurables (1550–1807).

The next take is darker, the camera moves again as if following a virtual person walking under the colonnades, however, this time the central space is filled with the walls of the church and the feeling is entirely different, claustrophobic, dark and even sad (Figure 5). The viewer senses the heavy atmosphere of the period when the building was a hospital for incurable patients. Two inscriptions appear in this part, the date in the well reporting when it was built and the dates over the entrance to the church denoting the period of its existence.



Figure 5: The colonnades and the church in the courtyard.

Following the rule of repetition, which pin-points the beginning and the end point of an era, the next take starts again from above, showing the church dissolving by crumbling to pieces (Figure 6).



Figure 6: The church is demolished—the removal of the church is represented in a stylized fashion.

As soon as the church disappears we notice the inscription on the facade in the courtyard that says “Centro di operazione maternita infanzia” (Center for the Rehabilitation of Minors). The camera flies past the inscription denoting the orphanage into an elaborate room which was, as the inscription on a stone plate reveals, a pharmacy, but now it is used for the library (Figure 7). In this room the viewer experiences the interior of the building for the first time.



Figure 7: The former pharmacy, now the library.

The room has many details, stucco and marble on the walls. The digital animation as it was realized concludes here by showing a very different space, by its luminescent floor maybe reminding the viewer of the concluding part of Stanley Kubrick's famous film *2001: Space Odyssey* (1968).

While still working on the project we also planned to make a 3-D scan of the frieze from the ex-pharmacy/library, however in the end it was not possible to include this activity in the project. The long frieze of stucco under the ceiling was constructed from the high resolution photograph simply by making a displacement map for it. It is shown in a close up, in a traveling of the camera in a new landscape of decoration, contrasting the previous plain white walls (Figure 8). Thereby a completely new domain of representations are added, which differs from the phenomenal world and opens up towards the universe of imagination consisting of floral and anthropomorphic patterns.



Figure 8: The close-up of frieze of stucco decoration in the library.

5. Use of software

The architectural blue-prints were referenced and reconstructed digitally first in AutoCAD 2D, creating the shapes of the floors, roofs and the vertical shape of the columns. Then they were imported into 3D Studio Max to give them the third dimension and every single part was moved in the right position. At last the details were added to the main volumes: the windows, the railings, the shutters, the bases and capitals of the columns, the flooring, the doors, the wells. Images were used as bump and displacement maps to create planar relief forms when possible: the stones on the facade, lace-like railings, some of the stucco decorations.

The virtual camera was animated using key-frames along a path. The accelerations, non-uniform movements, rhythms of walking and of vaporetto—as indicated by the virtual camera shot at the beginning of the video—were defined carefully. Some parts were animated with the help of a live-footage reference video.

The sea was created from a plane by applying to it a water material, to which a modifier noise was added for animation. We spent a lot of time to understand and recreate the right movement and appearance of the waves.

The crumbling of the church to pieces was done with a “warp bomb” algorithm, where it was possible to control the parameters of the explosion's strength: speed, gravity, the “chaos” parameter, rotation of the pieces while they fall down.

The video contains just two materials (shaders). The main focus was the material for the architecture, which is white to enhance the conceptual reading of the forms. However, this material has a soft feeling of an uneven wall, on which the light interferes with the surface in a more tactile and elaborate manner. The illumination of the exterior was done using a virtual daylight, that simulates the light of the sun, the color of the sky and the shadows in a particular location at a particular point in time, in this case: Venice in May at 10 a.m.

It was important also to fine-tune the indirect illumination of the sections, where the light can't reach directly, such as in the corridors around the courtyard behind the columns. Those parts, of course, aren't completely dark, which is achieved by setting the parameters that control the rays and the bouncing of the light.

The second material was the one used for the water of the laguna. The same material was applied also to the windows that overlook the laguna. The reduction of the number of different materials added to the clearness of the presentation.

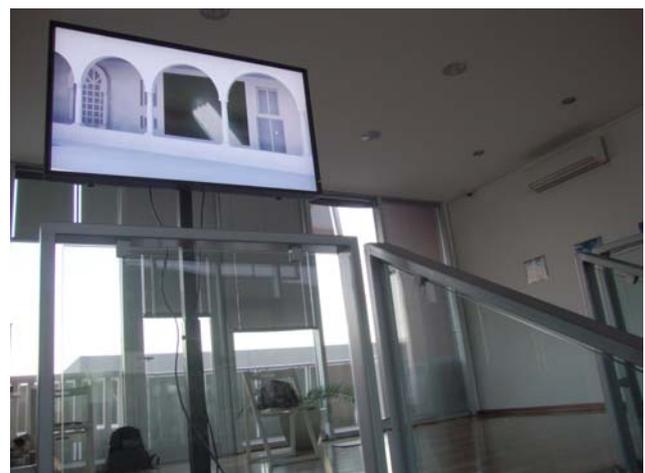
The interior of the library was illuminated with additional lights that simulate artificial light.

The scenes were rendered with Mental ray rendering engine. The rendered TIFF images were composited in Adobe After Effects. All the cuts were sharp. We used the transition between a series of key-frames to blend-in the church as it first appears in the courtyard.

6. Exhibitions

The digital reconstruction of a building, and of its historical transformations, does not provide us with a simple result. Apart from the video-animation the digital object has to be reintegrated into the existing communication practices, which is by definition not limited to the medium of scientific journal article.

This project was subsequently integrated in a video presentation of students' works from the Academy of Fine Arts of Venice—the footage of contemporary life in the building was combined with parts of the digital animation. It was shown at the meeting on the Cultural Property of the Academies of Fine Arts of Italy, organised by the Academy of Fine Arts of Naples and the Ministry of Education, University and Research of Italy in Naples in June 2013.



Figures 9 and 10: Exhibition of the videos of artists from ArtNetLab, Society for Connecting Art and Science

On another occasion, the digital model was used also as a virtual exhibition space: videos of artists from the ArtNetLab Society for Connecting Art and Science from Ljubljana were placed on virtual panels under the colonnades in the courtyard in the 3-D model of the

Venice Academy (Figure 9 and 10). For this reason, several additional digital animation clips were generated that showed each video in the virtual setting with an animated camera, which evoked the undercurrent of a history-laden space at the same time as it conveyed the most recent video works.

An important distinction emerges, which is crucial for reading the video image. The temporality of these artistic videos becomes related to the temporality of the video-animation, and to the historical diachrony of the reuse of the building in its location. The video installation of this virtual-reality exhibition was presented at the gallery Dimenzija napredka (Dimension of Progress) in Solkan, a town on the border between Slovenia and Italy, in October 2013. The virtual reconstruction of a building, and the videos in it, were presented in a real space—one architecturally very dynamic, consisting of glass surfaces that multiplied and reflected different objects, images, and screens—, which presented simultaneously other art objects, sometimes related to the videos in the digital animation.

7. Inspiration in similar projects

The task to digitally reconstruct the location of the Academy in Venice was a straightforward assignment in the phase of modeling the virtual building according to the architectural floor-plans. Afterwards the main question arose as how to present the virtual 3-D model. The digital video is only one possible solution, we could have created also an interactive virtual-reality space which is displayed interactively in a real-time video. A project of this kind was done in the Laboratory for Computer Vision at the Faculty of Computer and Information Science already in 1998, when Srečo Dragan, an established Slovenian new media artist, initiated (in collaboration with ZDSLJ, the Slovenian Association of Fine Artists Societies) the project of *Jakopič Virtual Gallery*, which was a virtual reconstruction of Jakopič's Pavilion, a venue for Impressionist art exhibitions since 1908, however, it was demolished in 1962. The virtual gallery reconstructed in VRML on-line 3-D engine hosted exhibitions of several Slovenian artists that could be viewed by walking through the model of the gallery (Solina, 2000).

The next decision needed was about the layering of information with the use of image-textures and compositing, i.e. as a new flat layer over the rendered virtual reality. An interesting example of such an approach is the reconstruction of the Parthenon in Athens done by Paul Debevec (2004), where the virtual model is shown in a fluid traveling of the camera around the model and between different modes of presentation: from the rendering mode in the wireframe to the polished surface of the same model after the textures, materials and illumination were added to make the image indiscernible from the camera footage of the real building. However, nowadays the hyper-realistic renderings of whole sets of ancient cities can be observed in numerous hollywood movies that use special effects at the highest level of verisimilitude. We needed a more conceptual approach, due also to the working hours and production constraints. Nevertheless, with a correct and very focused approach on the image of the final presentation, these were no real limitations.

A canonical reference for 3-D virtual spaces is a series of projects *The Legible City* by Jeffrey Shaw. The environment is similar to a—sometimes particular—city, but the buildings are replaced by large 3-D letters. Therefore the direct link to the verisimilitude is broken, and the space becomes a spatial constellation of semiotic entities. Such an approach was realized in projects *VideoSpace* by Narvika Bovcon and Aleš Vaupotič (2003), and *Data Dune* by the same authors in collaboration with Barak Reiser (2005).

It is important to note that all these project are related to computer games, however at the same time they explicitly do not use the gaming element. E.g. here is no problem solving and rewarding system. The 3-D computer generated space—either a real-time one or a photo-realistic high-quality rendered one—provides “non-verbal” modes of argument, which can efficiently mediate and interpret the historical records.

8. Conclusion

A reconstruction of a historical building that is linked to different social functions in its environment can never be reduced to its material 3-D shape, such as can be captured potentially by 3-D scanners. The key task in fact is to reduce the overwhelming masses of information available in the existing state of the architecture and in cultural records linked to the past appearances and uses of the site. Nevertheless, a mere reduction of the data resolution, e.g. the level of detail, is not the solution. What is needed is to convey the human experience of the place reconstructed and represented, either based on personal experience or one based on studying historical documents.

In the case of the building of the Ex Ospedale degli Incurabili which now houses the Accedemy of Fine Arts Venice the most striking insight that we have learned during the project is, apart from its different uses in history, the contrast between the existence of a large church in its centre and the, later, empty courtyard. This is an opportunity for the language of 3-D computer animation, which can simulate the atmosphere emanated from the enclosed spaces and looming volumes, and also the brilliance of an open space. The suggestive transformation—in fact a dramatic one, considering the past residents—virtually by itself invites new contents, liberated by artistic creativity. In the project we have embraced these possibilities and enriched the past with the artworks stemming from the context of presentation, in analogous way that the building itself has become the new home of Venetian art students.

The video-animation realized in the project is accessible on-line at the URL: http://black.fri.uni-lj.si/atlas_benetke_buziolvaupoticbovcon.

9. Acknowledgment

Our project was developed in the frameworks of the lifelong learning programme Leonardo Da Vinci (a European project) in collaboration between the Academy of Fine Arts of Venice and the Faculty of Computer and Information Science of the University of Ljubljana. The internship of the author of the digital animation Marco

Buziol, a former student of the Venice Academy, took place at the University of Ljubljana from October 2012 till March 2013 under the supervision of Assoc. Prof. Narvika Bovcon. Special thanks go to Prof. Laura Safred and Prof. Gloria Vallese from Venice Academy, and to Prof. Franc Solina from the University of Ljubljana. Thanks to the artists from ArtNetLab Society for Connecting Art and Science, who alongside the authors of this text contributed their videos for the virtual exhibition in the project: Jure Fingušt Prebil, Eva Lucija Kozak, Gorazd Krnc, Dominik Manič, Vanja Mervič, Tilen Žbona.

10. References

- Narvika Bovcon and Aleš Vaupotič. 2003. *VideoSpace*. Ljubljana, ArtNetLab.
- Narvika Bovcon and Barak Reiser and Aleš Vaupotič. 2005. *If you look back, it won't be there anymore*. Ljubljana, ArtNetLab.
- Anne Burdick and Johanna Drucker and Peter Lunenfeld and Todd Presner and Jeffrey Schnapp. 2012. *Digital Humanities*. Cambridge, Mass.: MIT Press.
- Renata Codello. 2001. *La Nuova Accademia di Belle Arti di Venezia*. Marsilio, Venice.
- Paul E. Debevec. 2004. "Making The Parthenon," SIGGRAPH 2004: Electronic Theatre. <http://gl.ict.usc.edu/Films/Parthenon>
- Jakopičeva virtualna galerija*. 1998. <http://black.fri.uni-lj.si/jakopic>
- Jeffrey Shaw. 1998. *The Distributed Legible City*. http://www.jeffrey-shaw.net/html_main/show_work.php?record_id=102
- Jeffrey Shaw, Dirk Groeneveld. 1989. *The Legible City*. http://www.jeffrey-shaw.net/html_main/show_work.php?record_id=83
- Franc Solina. 2000. Virtual technology and remote observation over the Internet for art applications. In: *Konferenzband EVA 2000 Berlin: Elektronische Bildverarbeitung & Kunst, Kultur, Historie*, pages 171-177. Berlin. Gesellschaft zur Förderung Angewandter Informatik e.V.
- Alvise Zorzi. 1972. *Venezia Scomparsa*. Electa, University of Michigan.