Roermond-Ecke-Schönhauser:
Creating live-models of distant realites

Abstract

"Roermond-Ecke-Schönhauser" is an installation, in which four webcam streams from various locations around Europe are reconstructed to tangible miniatures of the distant places. The webcam pictures are then projected on 3D-models of the particular places. Bringing a 2D picture to a 3D model, considering the sharpness and size aspects and building a mirror construction for directing the projection to several models, creates a particular aesthetic three dimensional projection system that captivates the audience's imagination. To many of them, the installation unfolded like a dollhouse, around which they would walk and observe different aspects from different proximity.

At the core of the installation lies the uncoupling of the screen and the object, letting the webcam streams become more realistic and tangible.

Figure 1: Webcam picture projected on 3D-model

1 Introduction

Why are there so many webcams on the net, when most of them lack any serious function such as security or traffic monitoring? Why do people build up these webcams and why are people watching them? Are they?
In fact webcams just show the real life, which is not very exiting most of the time. But as we all know this, those streamed pictures are more drawn from life to us, than any event on which e.g. a broadcast is focussed. Webcams open the most direct tunnel to a foreign reality.

2 Research/previous art

A very interesting perspective to the appeal of webcams is in their facility to bridge a connection between local and distant reality. Following this appeal, a natural question is how to bring this connection even stronger, emphasizing the idea of a tunnel to a distant reality. Would aural connection or one to one spatial scale strengthen this connection? Should several cameras be connected? Beyond these other modalities, a fundamental quality is in its medium, the screen, which is outside from real life, beyond touch and feel. The intention was to improve this tangibility in the connection between two locations.

I started my research about adequate webcams and webcam projects on the one side, and on the other side, about possibilities to make some picture on the screen become real, tangible.

As public known the first webcam filmed a coffee-machine [Jardetzky et al. 1991]. Nowadays there is a endless number of webcams in the world, which can be classified as:

- public street cams
- private cams
- special cams, which show only one object (e.g. animals)
- offline cams

But what could be done with this streaming technology?

The first real tunnel-like project, which wasn‘t done with digital web technology, but with video, was the “Hole-In-Space” [Galloway and Rabinowitz 1980]. It was a undeclared video-conference between New York and Los Angeles. The idea of creating a tunnel is very intense in this project, as the picture from the other coast was displayed in life-size and in the same environment, where it was filmed from. Another connecting places project is iCom [Agamanolis 2003]. It already tries to bring together distant places in our every day life, to create shared social spaces, where we can communicate in a leisure atmosphere. But Agamanolis‘ tool is for communication and his intent was not to fetch a distant reality to the here. An approach to use webcam data, is a living world map, created from about 1600 webcams, called “netlag world webcam map” [Pleix 2004]. The application generates a world map, consisting of small webcam pictures filmed from where on the map it is displayed. This creates an overview on the real-life system earth especially on the rhythm of live caused due the rise of the sun.

But none of these projects aimed for creating something tangible, while on the other side there are possibilities to bring digital information to something real:

One approach is „Displacements“ [Naimark 1980], where real live objects loose their color and only leave the shape. The color is projected to the objects with a video-projector. So the virtual data, containing color information and the localization of the colors, could be transformed from virtuality to reality by projections, which also allows real-time changes. Now there‘s still the shape, which can be estimated from analyzing a picture, and can even be rebuild in the computer as a 3D-model, but cannot be displayed in 3D yet. There the project theRoadMovie [MobLab 2005], inspired me. Here the model of a bus, which windows show the webcams pictures out of the bus, can be folded according to a folding map. This idea of using folding technique to create 3D-objects from the 2D output device printer lead to the idea of folding up the architecture on the webcam pictures, which after first real folding tests with paper ended in 3D-plotting with a rapid prototyping printer. Another inspiration were the catadioptric projections of Rahul Swaminathan, who uses custom mirrors to make the projections fit on the models and avoid deformations [Swaminathan et al. 2003]. But in my case, my preference was not this complete matching system between camera and projector, which was especially created for it‘s function. Instead I grabbed existing streams from optical systems I didn‘t build up myself. So I regard the deformations as fragments of the process of wrapping reality to digital information.

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I noticed, that all the parts of bringing some webcam to something tangible, were already developed. There is the streaming technology which is now common property for every consumer, and therefore very real life. Then there is the video-projection technology, which generates the colors on the real live objects and also can be changed in real-time to make the model a kind of ”live” object. Last missing element is the shape, which can printed on a 3D plotter. So I accomplished them, as follows:

After finding out four good streaming cams (Denmark, crossing; Amsterdam, laundromat; Berlin, courtyard; Holland, marketplace), which architectures suited my ideas, I rebuild them in a 3D-application, using camera-mapping, to virtual models. The difference between the optics of the projector and the webcam induced deformations in them, which I regarded as artefacts of en- and decoding, like known from the jpg-compression. So I didn‘t try to correct them, like Rahul Swaminathan would have done. Instead I twisted the form of the models, so the picture will fit on. I checked all the optics, sharpness stuff very exactly by measuring and then printed out the four models on a 3D printer. In the end the models gained the size of about 18 x 18 x 8 cm, which could be illuminated sharp at a distance of 1 meter. To redirect the light for the four models, I developed a mirror construction using antennas as joints.

Figure 2: Mirror construction

The arrangement is in a semi circle, where the mirror construction stands in the middle of it, in front of the projector. The rest is positioned on the circular line. Two models are positioned left and two right of the projector. So the projector directs to the mirror construction, which brings the light to the models. That way they get their colors and real-time touch. Their shape is fixed, what is absolute adequate, as webcams stay watching the same all the time. The result are four live-miniatures of distant realities, which can be regarded three dimensional and even be touched. They are adapted as real, instead of virtual pictures on the screen.

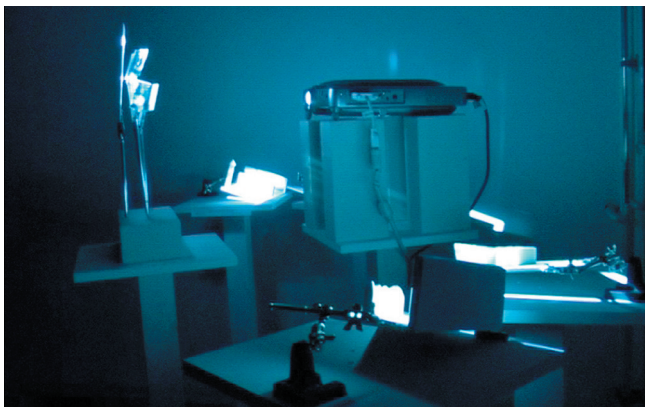

Figure 3: Arrangement with projector, mirror construction and four models

4 Impressions

After building up the installation I realized that for viewers already the deformed spacey white models with their perspective distortions looked like sculptures. They enjoyed the mirror construction and the idea of the four arranged 3D-displays instead of one screen. Even the OS windows looked good for them, as they were divided to the four models. But what it was all about is the difference to the webcam pictures. And here at first I have to say, that there was no trace of the boredom of webcam pictures, perhaps because of the bite-sized presentations without searching for a good cam on the web. But, in my opinion, more because it feels like you look at a small world, where „different" humans live in. It reminded me of children looking at a doll's house or people in the zoo. This of course created estrangement and took the places even more far away, instead approaching them to us. And there was this god-feeling, known from computer games, even if you can't interact with the people in the models. So the main point is, that it created a new reality, and did not bring people together, what I would have expected.

5 Conclusions

Projections on 3D-objects are very aesthetic, and they get an special appeal, if simple architectural forms are mapped on deformed objects, in a way that the displayed information fits the models, but the models are not rebuild true to the original. This aesthetic quality is mostly caused by the uncoupling from the screen, generating a new way of perception, which is even more in a way of touch and feel, caused to physical items, than a 3D-display would be.

6 Future work

For the further development of this project, I'm asking myself, which places would I personal like to have as 3D-models on my side? Are there places of my family or friends, which attract me? And in the future, if there is the possibility to create such models out of light with 3D-projection, would this build a stronger bridge to a distant space, because of more flexibility? Or stays the material manifestation still more real? Combine them?

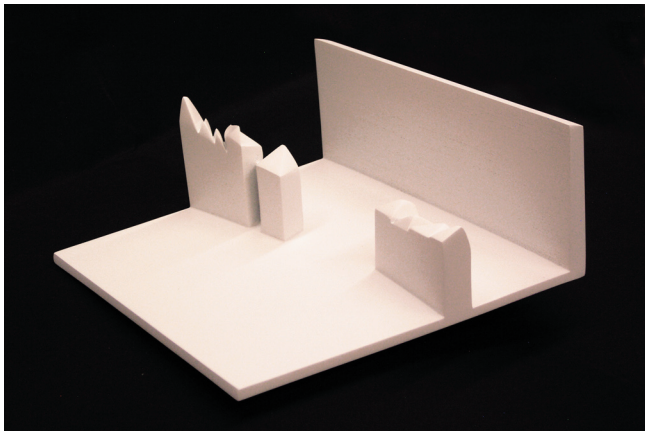

Figure 4: Unlighted model

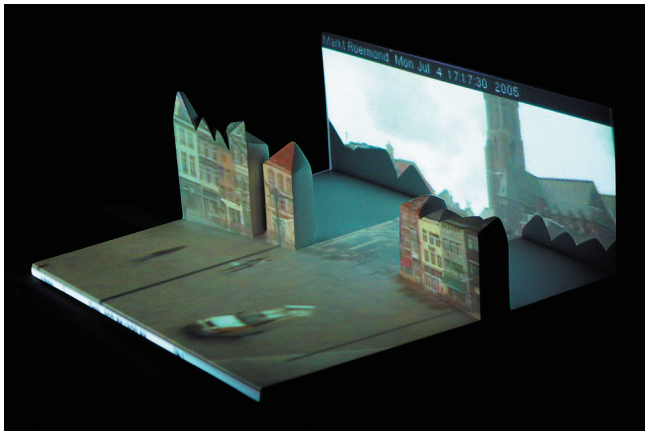

Figure 5: Live-model

7 References

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