Recombinant Realities:
The Design of a Multi-User Environment in Cyberspace

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Abstract:

The combination of the field of architecture and currently available multi-user technology could be considered as an ideal testbed for designing the vision of shared cyberspaces. A concrete CAAD course is described to demonstrate how architectural knowledge is used to create a virtual exhibition inside an online, three-dimensional, avatar-based environment. Furthermore, the theme 'Recombinant Realities' is proposed by fabric | ch [1] as an imaginative layer that tries to connect and elaborate the various ideas proposed by the different student groups. This concept represents a hybrid and mutated reality, as it suggests that real and virtual environments can be ultimately connected and mixed. Additionally, some issues dealing with the technical implementation and the remote collaboration process involved are explained. As a result, the created electronic world itself proves how both artistic and academic domains can merge their conceptual ideas into a creative and educational course.

1. Introduction

'Recombinant Realities' is the name of a series of online exhibitions, featuring the creative works of different groups of artists and architects. Their digital creations are set inside a virtual, three-dimensional environment, which is enriched with a set of interactive multi-user features.

The entire event, called 'La_Fabrique', was originally initiated and organized by fabric | ch [1], an electronic architecture firm based in Lausanne, Switzerland. The Chair of Architecture and CAAD at the ETH-Zurich was kindly invited to take part as the second collaborating group in the event's structure of four successive phases. Senior students and teachers of the elective CAAD praxis course were offered the opportunity to create digital art/architecture installations inside various pre-defined, virtual rooms. These spaces acted as metaphorical containers that enclose the borders of the design concepts and inherit at the same time the dynamic community life generated inside the whole surrounding exhibition environment itself.

The title 'Recombinant Realities' provided a common conceptual thread among the various installations in the exhibition. Even more, this imaginative phenomenon of co-existing and interwoven experienced realities was proposed as a possible theoretical framework to understand and design cyberspaces.

In the final stage, the resulting digital collection of files were hosted and thus opened to the public on the '2nd World' [2] website of Canal+, a large French subscription-based television channel consortium.

2. Places in cyber-'space'

Places in cyberspace are mostly software constructions, creating artificial environments of interaction, virtual realms that humans can enter. Basic examples of this point of view can be surprisingly simple and well known, like a one-dimensional place in the text window of a word processor, a two-dimensional desktop surface, a three-dimensional virtual room, or even a N-dimensional place in an abstract data structure. Just like architectural and urban places, all these manifestations have characteristic appearances, and the interactions within are controlled by pre-defined rules.

Since the cyberspace description of 'Neuromancer' [3], the connection between electronic places and the field of architecture can be linked to some interesting visionary thoughts. For instance, Michael Benedikt [4] is convinced that scientifically and poetically minded architects, schooled in computer science, programming and abstract design, should start to design by first creating 'crude' and 'fragile' 'cyberspaces' with a limited number of users, out of which the most essential design and interaction lessons can be learned. For William Mitchell, the notion of 'human habitat' is being reinvented, as "the new urban design task is … writing computer code and deploying software objects to create virtual places and electronics between them. Within

these places, social contacts will be made" [5]. Dace Campbell [6] in turn is convinced that the design of *virtual architecture* will require the expertise of traditional three-dimensional designers. Finally, many of the projects presented by the Chair for Architecture and CAAD of ETH-Zurich [7] try to demonstrate how architecture and cyberspace can enrich each other in a continuous creative relationship.

Already at the early conception of the term 'cyberspace', the analogy of the city was used to illustrate the hybrid structure of the electronic realm. Nowadays, many online virtual worlds such as Cybertown [8] and Activeworlds [9], demonstrate large-scale, graphical and shared environments in which different forms of interaction are possible, but design and theory do not play an important role. In this project, however, we brought the concept of 'Recombinant Realities' together with the Chair's multimedia background, to introduce a possible approach to design engaging electronic spaces.

3. The design process

3.1 Collaboration

Most of the course was driven forward by a process of distant collaboration, demonstrating a new way of organizing electronic exhibitions through private work galleries. Several videoconferences were organized so the authors could discuss their design ideas and technical difficulties with the exhibition curators. To support the work process, a course website offered the authors various useful pointers to time and assignment plans, sources, texts, tutorials and FTP-accounts. Additionally, all the participants had access to more classical tools, such as a mailing list and a multi-user chat room within the given pre-built environment. This gave the opportunity for the different partners to directly meet and discuss inside the virtual structure.

3.2 Learning process

In a unique collaboration with the external exhibition curators, students had to react upon a 'real' assignment that in the end would be extensively used by a wide audience. The exhibition authors had to be technically capable to express their creativity and ideas inside a digital, three-dimensional reality. Therefore, they were introduced to some of the software packages and multimedia techniques that are commonly used for three-dimensional online publishing. These essential tools included a modeling program (3DStudio Max), a video editor (QuickEditor), and a VRML (Virtual Reality Modeling Language) authoring application (CosmoWorlds), next to some hand-written VRML programming.

Divided into small teams, the participants were challenged to use their architectural knowledge to design a new kind of virtual environment, meanwhile dealing with the concept of 'Recombinant Realities'. In the initial process, mainly small experimental prototypes were being programmed, so the authors got the chance to get accustomed to the collection of newly learned tools. At the same time, new insights were discovered, learned, discussed and studied in the context of the whole group.

3.3 Technical issues

Essentially, the project coordinators provided the authors with a small set of interlinked files that had to be 'filled' with meaningful and conceptual content. In this course, the three-dimensional environments were being built based upon VRML technology. By using this well-known standardized programming language, the students were offered a wide palette of powerful tools, such as a low-level scene graph, animation, scripting, sensors, sound and light nodes. Together with VRML's high degree of interactivity, user control and the simultaneous blending of two- and three-dimensional objects and multimedia effects, these features give virtual architects the ability to design interactive and dynamic virtual worlds.

The appearance of the avatars inside the environment was chosen to be variable. Online users could be represented by floating IP numbers, flat humanoid billboards, or dynamically animated, three-dimensional human look-a-like actors, depending on the used Internet browser plug-ins, such as blaxxun [10] or rhizoreality.mu [11]. Furthermore, in order to be easy accessible for ordinary Internet users, each of the installations was allowed a maximum of 250 kilobytes of compressed storage space, including sounds, video, images and VRML code. This strict constraint proved to be an important design guideline throughout the project.

4. Recombinant Realities

4.1 Concept

Defined by fabric | ch, the concept of 'Recombinant Realities' is a thematic playground that is supposed to be used and shared among the different creators involved in the whole exhibition event. The overall project is understood as a 'crash test' environment for new ideas shared along the working process, as the pre-defined digital environment can actually be totally modified by the participating authors.

Conceptually, 'recombinant' is a word most often used in a biological context, to describe a genetically modified organism or cell. Here, the idea of Recombinant Realities consists of the network, the

electro-waves and the digital spaces, that all represent the emergence of an extended reality that adds itself to the already existing environment. This augmented reality is a deformed expression, an accelerated evolution of society with which our physical world constantly interacts. Following P. Theilard de Chardin [12], this could be described as a new layer of information, the so-called 'noosphere', which adds itself to the already existing 'biosphere'. Being in a continuous relation to each other, they enter a process of information exchanges (energy, order, ideas,…), out of which new landscapes and territories are emerging. New architectures, social relations and forms of communication that we can call 'recombinant' are emerging as well. For instance, the quality of space, of the air (electromagnetic waves) has been changed. Our physical body, our individual identity and the relations we have with the outside world as human beings, and other things are modified and altered.

Similarities can be discovered with the basics of information theory by Claude Shannon [13], and also Norbert Wieners' writings on cybernetics [14]. These theories describe physical and energy relations between nature and machine, man and machine, and in particular, man and computer, considering everything as information/entropy, even mankind.

4.2 Space exclusion

As a unique feature of this environment, the virtual exhibition rooms were essentially interpreted as a collection of electronic files. These files can thus be shared, but posses no fixed 'place' inside the world coordinate system of the virtual space. Subsequently, this concept allows several avatars to see and interact with each other within certain commonly distinguishable space boundaries, although these users could possibly perceive a different room surrounding them. It should be noted that this feature is in clear violation of Benedikt's 'Principle of Exclusion', which states "you cannot have two things in the same place at the same time"[4]. Own research [15] proved that this restriction could nevertheless be an interesting 'quality' of electronic worlds that, according to Marcos Novak, "allows a poetic merging of objects into evocative space"[16].

As no one is really sure what the others are looking at or interacting with, different realities become 'recombined'. Consequently, the project reached some paradoxes regarding the typology of possible future cross-relations between virtual and real spaces, their architecture as well as the type of relations they maintain: one can see different spaces while being at the same virtual place, but one can also have his body and mind immersed in a virtual room while being physically present in another real room. As real and virtual realities become both (re)mixed spaces, their architectures should take this new paradigm also into account.

5. La_Fabrique

The gallery/file system environment, called 'La_Fabrique', is made out of four different and distinct areas. Textures and sounds were taken from a recording trip during ten seconds inside the apartment of the designer. The main access file uses switch nodes on top of stairs/arrows to go directly into the separate galleries or files. Two galleries enclose the temporary rooms that are displaying the works of the individual participants and other unpredicted content. A URL gallery possesses the links to thematic works and other relevant online references.

Visitors were able to 'jump' from one room to another by walking through fixed, texture-mapped boxes that represented digital doors. Furthermore, a console revealing the faces of the artists offered users a more direct way to choose the separate installations.

Figure 1   La_Fabrique

Most of the works contained highly interactive features. Various dynamic sounds and events, triggered by certain user actions, augmented the experience of immersion. Ultimately, it can be concluded that the careful use of different kinds of multimedia proved to be essential for the quality of the individual works.

Cyberspace was seen as a truly conceptual space, capable to be 'filled' with context and content that links to, and re-uses, reality. For instance, one author saw the virtual space as a living organism with its own unique wishes and desires, to which the user's avatar had to react and got rewarded (Fig. 2).

Figure 2 Agitated Space

More poetic concepts that touched on the dreams and concerns of everyday life treated the pre-existing spaces as contextual borders that enclosed their personal possessions, as a private gallery of their minds (Fig. 3).

Figure 3 Realities Personalized

The lack of gravity, for example, inspired some students to interactively alter and rotate the entire environment in a dramatic way, so that the drastic changes in space-perception could be explored (Fig. 4).

Figure 4 Dynamic Labyrinth

One participant understood cyberspace as a metaphorical space in which a spatial timeline and a set of personal sounds guided the users through her current curriculum vitae (Fig. 5).

Figure 5 Space-Time

6. Conclusion

The participants learned to collaborate with artistic minded partners from outside the academic world using various communication means. Furthermore, they worked with new technical multimedia tools to design content-rich three-dimensional virtual worlds. The authors also dealt with the concept of Recombinant Realities, a rich playground in which many metaphorical relations could creatively be brought forward. By providing them with this framework, they stepped away from architectural simulations, instead considering cyberspace as a phenomenon that deserves its own design language and theoretical background ideas.

Conceptually, the architectural students differed with the other participating groups of the event in the way they were concerned about the quality of the modified space itself, as they concentrated more on some of the yet unexplored architectonic aspects of digital, shared spaces.

It could also be remarked that the educational strategy was based upon the successful implementation of the online exhibition, which was meant to be seen by the wide public. Consequently, the students were highly motivated and felt responsible for the technical, conceptual and aesthetical qualities of the whole work. Many discussions within the group and between the partners of the project, consisting of people of different professional and cultural backgrounds, proved to be inspiring and instructive. As a result, the created electronic world itself proves how both artistic and academic domains can merge their conceptual ideas into a creative and educational course.

7. Acknowledgements

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