Common Playground

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cast01 // Living in Mixed Realities

Conference on artistic, cultural and scientific aspects of experimental media spaces.

In this paper we present our experiences in using a computer game platform as a development tool in the areas of art, architecture and drama. Our approach has been to find ways to do quick prototyping and testing of ideas in a virtual space. We strive at building general applications independent of the 3D platform used for the specific case rather than getting stuck in a certain game engine or technological generation. The focus has been on the constant dialogue between the concept and its form. Today's Computer games seem very fit for our purpose.
Projects presented run at Space respectively Narrativity Studio, Interactive Institute in Malmö.

Keywords:
multi user, art, architecture, drama, computer games, virtual space, avatar, body movement, collaborative story telling

Project URL

www.creativemotion.dk

1. Half-Life – a creative environment?

During the last couple of years we have looked at the game industries in comparison with the more military/industrial oriented VR market. We have also followed the development of the wrml standard for communicating 3D models on the Internet. Both these tracks has in more than one way led us to the enlightenment that there maybe other ways to work with 3D as a communication tool in a multi user environment.

The criteria that I was looking for were that it should support the following features:

- Multi-user environment at least 16 users simultaneously on line

- Hardware graphics support such as textures, dynamic lightning, bump mapping, displacement mapping and other real-time effects.

- Support for both first and third person view

- Communication tools voice or at least chat.

- Server management – to be able to set up your own server and manage it as you want - giving users different access and privileges.

- A graphics editor available for both building worlds and manages content. If possible access to source-code or even a SDK.

At Malmö University K3 - in one of the interaction design master classes we started our first Hal-Life projects. In one of the so-called research themes in Digital art the students where introduced to a series of paintings from the late 1800, which all communicated a certain mood. The artist often has a close relationship with both the tools and the material that they are working with. In the connection or confrontation with the material new ideas and decisions takes place constantly. In this situation of give and take you soon learn what limitations the material and tools in this case the software set up for you as designer. But it also reveals possibilities and directions you couldn't imagine beforehand. So instead of letting the students observe and evaluate a 3Dgame or a level designer or a graphical artist's work. They where forced to go into a new domain, learn new software and try to communicate something as hard as a certain mood in space. The goal was to build a room or a world that communicated a certain mood.
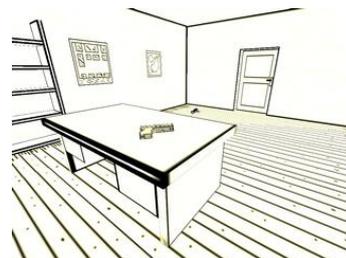
The student was introduced to a game level design program called worldcraft. They had 2 days of training and then the spent about 8 to 12 days building their worlds. The where also introduced to different websites dedicated to Half-Life and Half-Life editing. They were encouraged to take part of the several discussions list about Half-Life editing and to download scripts and models to use in their work and part of the learning process. The overall impression by the students was that the editor wasn't hard to learn but the editor (WorldCraft 2.2) had the computers go mad at first. But as the students gained experience the crashes came more seldom and in the end the actually felt that they could work around most of the shortcomings of the editor. They find that when they got a grip of the editor it was fun an engaging to work with.
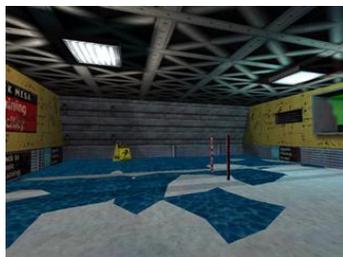
At the presentation the students where allowed to play each world and make notes of what feeling the experienced playing the other students worlds. Surprisingly about 80% of the students manage to communicate their intentions.

To see students with no experience with architectural design so easily take control of the designing these virtual spaces in such rich and interactive way, led us to choose hl as our development tool for the projects to come.
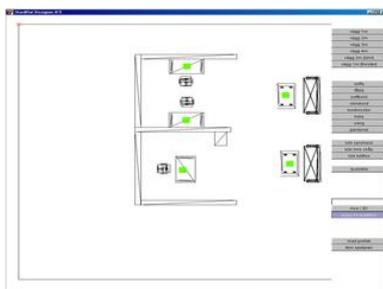
2.1 Half-Life – a rapid modeling tool?

One of ForeSites project goals is to integrate our experiences from collaborative spatial and architectural design using Virtual Reality into a digital modeling and visualization tool based on Half-Life's game-engine. We have therefore developed a couple of prototypes for rapidly designing 3D environments in 2D space. Johan Torstensson a student at Malmö University K 3 developed the first version of the prototype called hardhat designer. In its first appearance it allowed the user to access a small database of 2D elements, which then could be distributed on a 2D surface. On that surface the user could divide the space with walls in different lengths, insert windows and doors etc, and furnish it with different items as chairs, sofas, and tables. A set of eight prefabricated "placeholders" was also introduced to mark different objects or events. The detailing and visual quality of the 3D/VR worlds seems to be adequate for the chosen tasks. The 2d layout was then compiled into a lightened 3D/Virtual Reality world in Half-Life. Here the user could navigate trough their newly constructed space.

2.2 ForeSite Designer & Playgrounds

Next step was to develop the Hardhat concept further into something called ForeSite Designer where you could create different kinds of Playgrounds. The basic idea was the same but some new tools for rotating, multi-selecting and deleting objects was introduced. The size of the playground could also be varied according to task. The possibility to use a background image was also introduced. But the new and main focus was to investigate different kinds of representations both in 2d and 3d space We knew that from the very first tests of the Half-Life game-engine that light made the spatial representations "come alive" without having to overload them with irrelevant detailing [1].

2.3 Workshops with Half-Life and ForeSite Designer

Half-Life and ForeSite Designer has then been tested in workshops together with external users. The 3D/VR possibility was used for evaluation of what was built in 2D but also immediately generated a lot of new ideas, which then was executed in 2D. The presentations where made in front of a large projection of the virtual spaces they just had modeled. They could here immediately interact with a Virtual Reality/Half-Life world in scale 1:1 of the scenario they just had designed. After the workshops the participants and

others also had access to the worlds on a Half-Life server over the Internet. There the workshop participants, their colleagues who had not attended the workshop, the research team and others could meet, look around and discuss (in Half-Life there is a text chat feature available for simple messages on line) the outcome from the design exercise in a multi user environment [1].

2.4 ForeSite Designer for innovation and understanding

In our test cases we found that game based VR is a usable tool in architectural design processes. ForeSite Designer showed to be effective for expanding ideas and gain a better understanding of the design task. Totally untrained persons were able to build rather complex furnished and lightened workspaces within short time limits. It was fun and stimulating to use, promoted innovative thinking and in that way activated the design process. Our conclusion is that this is due to the fact that the actual design of the virtual spaces forced the participants to combine different ideas, negotiate and prioritize. In this way the design tool deepened the understanding of the complexity of space [2].

3.1 Communicating Moods in Space

This project, defined in Narrativity Studio, aims at developing innovative metaphors for spatial expression and communication. To design a virtual narrative space, which combined with event scenarios, inspires collaborative creative processes and establishes a meaningful relationship between virtual space and reality. The mode of communication is physical rather than textual.

For these purposes I was looking for a virtual environment to support: multi user environment, open SDK for application development, openness for character animation and behaviour control. In collaboration with the Space studio I chose Half-Life as my first test platform. For the first half-year prototype I have looked closer at two areas:
*Pace in Space*
How do we physically communicate and experience stories together in virtual space? How to create a virtual space that in a haptic sense inspires the pace in space.
Trace of Pace
How to define dynamic drama structures that allows the space itself to become an actor. In the role of actor the space may embody memories and let events and stories told integrate physically in space as trace of pace – the story and memories of actors pace as well as the space itself.

3.2 The Mixed Reality Platform

With a long-term goal of building a flexible and open application and not putting too much effort in Half-Life specific solutions, a *Mixed Reality Platform* was formulated. The aim of this platform is to create a flexible meeting point between physical and virtual space, an open environment and interface to different 3D engines as well as flexibility in relation to user interfaces. The platform consists of a protocol and a software package (API), based on the same protocol.
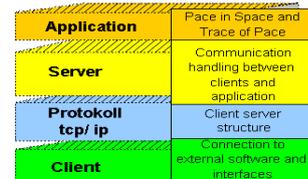

The protocol is to handle positioning, movements in virtual and physical environments and support several input devices and systems - in the range from microphones to tracking systems.
The software package is meant as a support for other people who are interested in developing applications for the platform and is developed by Johan Torstensson as Master work in Interaction Technology, Malmö University K3.

3.3 Creating Drama

The choice of drama structure is striving at finding ways of "fighting" for collaboration. This is the point of concentration in theatre improvisation and many traditional games. To implement the method of creating drama by establishing a conflict, I have chosen an old tagging game called "*Stone, Wolf and Lamb*" in the first prototype. The plot in short gives *Wolf* hunts *Lamb*. If *Wolf* gets *Lamb* they change roles. *Lamb* may jump over a *Stone* (also a Role character playing a stone), then *Lamb* becomes *Stone*, *Stone* becomes *Wolf* and *Wolf* becomes *Lamb*. This game is implemented as a multi player computer game in Half-Life, where actors interacts through their Roles in first person view.
Specific for the chosen game is a constant change of Role. This gives the actor/ player different relation and point of view in the game played. This changing of roles also creates the circular dramaturgy where there is no winner.
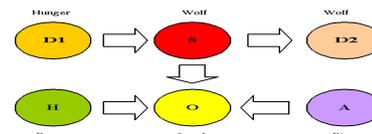
The theoretical model used for structuring the dramatic scenarios is *Semantique Structurale* [3], a structural interpretation of a narrative where a *subject* (S) with *driving* force and quest (destinateur D1) to get *object*

(O), with the goal to satisfy *receiver* (D2). Added to this main story, there is the *helper* (H) who supports the main story and an *antagonist* (A) counter acting the main story – in all 6 *actants*.

Applying this structure for playing the tagging game in a virtual playground opens up for a dynamic environment introducing Fools (autonomous Roles), Space, "God-Role", Sound or groups of Roles acting as *helper* or *antagonist* to the main story with a common dramatic function.

A feature in the *Mixed Reality Platform* is a 2D overview of the playground and current active players in a LAN network. In relation to the dramatic structure this may be interpreted as a "God-Role" acting as director or Fate acting as different actants, but is not yet explored as part of the game.

THis drama structure is also interesting when looking on definition of actor viewpoint. In what Role do you experience the story told? In the prototype I have chosen the actor to be either of the three main characters *Stone*, *Wolf* or *Lamb*.


3.4 *MoodBody* – emotions in virtual space

The ways to communicate emotions as sorrow, fear, happiness are many. We laugh and hug each other using our body, but how do you communicate all this at distance, different time and space – in virtual space? The design of the *MoodBody* is inspired of physical theatre and focusing on body expression and communication rather than facial expressions. Striving for a non-realistic environment and scenario the movement design is in the field of extra daily behavior.

My goal was to find a non-realistic "clean" character body, optimal for body expressions and with a neutral mask. These criteria's also to open up for the Role change transformations. The 3D character models are developed together with Michael Johansson in the

Space studio. My inspiration for character model is simple line drawings by Carlo Blasis [4].

Character movement is designed in the context of the game. In the process of defining motion for expressing moods, I find it important to put the moods in context. Like in improvisation relations is as important for the development of the story as individual basic moods and emotions. Our mode of motion capture for this first prototype were by shooting live workshops in video, which was the raw material for the character animation. Workshops were arranged in collaboration with Kent Sjöström, teacher at the Theatre Academy.
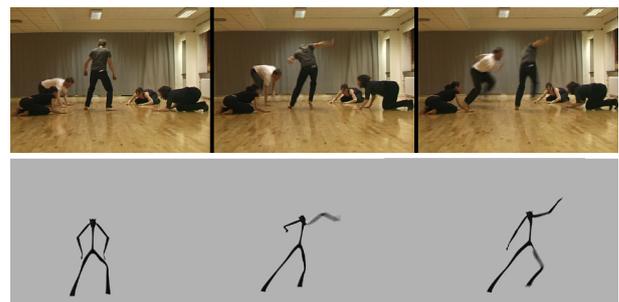
3.5 Pace in space, Trace of pace and Space

The playground is a white rectangular space – narrow but with high roof staged by light and sound as ending in "heaven" and "hell" respectively.

The *Pace in space* implements the tagging game and *MoodBody* as the basic game rules, controlling the drama structure, multi user environment and the over all behavior and timing.

When defining *Communicating Moods in Space*, the *Trace of Pace* was defined as a separate structure due to restrictions in Half-Life real-time features. When using the *Mixed Reality platform* the trace function is a real time implementation and becomes an integrated part of the general game rules.

The *Trace of pace* is concerning "physical" embodiment of dramatic events, spatial events and Role behaviour. This is Space taking part in the drama as an *actant*. In the prototype traces are implemented for Role change, traffic in space and Wolf behaviour (a good or bad in relation to Role defined goal). As examples implemented, a role change will place a plant to grow, creating a jungle over time, movement in space as traffic will generate markers of different intensity and colour and *Wolf* getting tired in relation to the tempo and performance of his Lamb hunt etc.

Experiences in the *Forsite* project in the Space studio shown inertia to make people move around when visiting virtual workplaces etc. Using the method of conflict in creating drama we wanted to experiment and inspire actors/users experience space in an open minded way. At an internal institute workshop on rearranging our own studio workspace, we used the *Stone Wolf and Lamb* game as a "Design game" - as an introduction to use and experience space as well as a motivation to learn the Half-Life interface in a playful way.

In this workshop I also wanted to experiment with the space design in relation to the dramatic structure – *Space* as *helper / antagonist*. In contrast to the original rectangular open space, a lot of effort where put in finding the object of desire when playing in a more complex and layered space, which need to be integrated and considered in relation to play structure.

Game rules are implemented in JAVA as the first costumer to the *Mixed Reality Platform. Game Rules* is developed by Per Larsson and Jens Henriksson, as Master project, Lund Institute of Technology /Multimedia.

3.6 Experiences of virtual play

Using VR as augmented imagination is stimulating when playing games. Playing in virtual space gives a unique opportunity to design exciting and dynamic play space as non- realistic, interactive and participating.
With actors playing in first person, the aspect of design for presence is important - to communicate the Role - "How do I know I am a virtual wolf?"

The neutral character bodies are designed in order to be open to actor's fantasy and interpretation. In this prototype the body language and character behaviour is not fully developed which gives the disadvantage of some confusion of identity. This is partly due to the game itself (it is really confusing also in material space, which is part of the game…).
For the final prototype state the Role identity is designed by character sound (*Stone Wolf* and *Lamb*), different view points and sound markers for Role change as well as Wolf using paw for hunting. Finally we worked with Role head to identify actors in Role. As long as actors not playing they keep their neutral body.

When focusing on body as expressive media and mood communicator, the question of alternative user interface is of big importance when finding solutions to integrate body and technology. Next step in project is to look at our relationship to technology and how technology integrates itself into the creative process, shapes content and potentially can assist in taking the work to a deeper level of consciousness where both form and content are interwoven.

4. Conclusions on Half-Life as playground

Half-Life has proven to be a good environment when it comes to building simple spaces. The deliberate use of textures and lightning is good ways of stage the virtual setting. When the architectural models get complex the compilation times rise dramatically which makes tools like foresitedesigner not so attractive, because the time span between the shift between 2d sketch (editing) and 3D environment (visualisation) takes to long, and make the tool less interactive. The lack of possibilities to import 3D models from other 3D packages is a shortcoming of the worldcraft editor. Animation is another area that is very limited and restricted both in the 3D resolution of the characters, and the way you handle and script animation. The Half-Life SDK is available for free but as you start to dive deeper into it the support in both documentation and on all the HL forums tend to be missing. So you have to consider the time spent in a free editor with open source with little support in relation to the commercial available game developing platforms. Half-life has however made it possible for us to tryout and test our different scenarios in a short timeframe. The strategy of building separate modules as foresitedesigner in Space Studio project and Mixed Reality Platform, Game Rules and Trace function in Narrativity Studio project has made it possible to separate our development from the actual 3D application or engine. This lets us use the 3D environment suitable for our projects without each time starting from scratch.

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