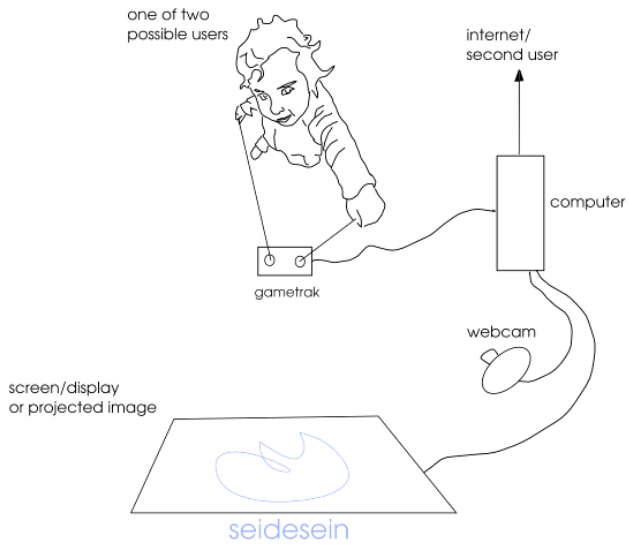
seidesein

by daytar (Tim Hoffmann, Nadja Kutz)
www.daytar.de
contact:nad@daytar.de

seidesein

seidesein is an interactive environment, which explores possible forms of communication in virtual 3D space. seidesein is an attempt to convey some aspects of human touch (without actual body contact) into virtual space. The metaphors of silk, skin, water and light (from skin) are used.
seidesein can be used for communication in a network.

How does seidesein work:



For the interactive input seidesein uses a device which is called gametrak. The gametrak is widely available in media shops. It is produced by the company In2Games: http://www.in2games.uk.com/testsite/index.php
It is mainly used for playing virtual golf or for virtual boxing.

The game track consist of a solid, rather heavy box and two straps, which can be pulled out of the box. If one releases the straps, then they are mechanically

torn back into the box. The information of the distance between the box and the endpoints, as well as the information of the angle between the respective strap and the vertical direction are tracked and can be read in by a computer.

The gametrak is used as an input device for seidesein, this works in the following way: If one moves the two straps of the gametrak then a virtual veil can be moved around in virtual 3D space. The pullback force of the gametrack is felt as a slight "gravity" acting on the virtual veil. In particular if the two straps are pulled out and if one does not move then the veil is hanging down in virtual 3D space i.e. we modelled a slight virtual gravity. The videoimage of the user which is read in by a webcam is attached to the virtual veil. This attachment looks like a projection of the videoimage onto the veil if the veil hangs calmly down, however if the veil moves then the image on the veil acquires the quality of a stretched virtual moving skin. It is no projection anymore. The actual appearance of the user varies by the way the virtual veil/skin is moving.

The user moves in two ways – he or she moves in order to move the veil (for input) and he or she moves as his/her own image being attached to the veil (so to say as a flat avatar) in virtual space. Real movement and virtual movement are interlinked.

seidesein is intended to be used by two people so that they can dance/move together with the two veils. This means they can dance together in virtual space, they can move around each other and into each other.

seidesein can be used via a network. The transmission of the veil data is negligable in contrast to the data load of video signal. If one has a decent connection which allows for video conferencing then one can dance together with seidesein.

Technical description

space requirement for an installation:

One needs approx. $5m^2$ for the movements of two users. In front of this space there should be a screen of approx. $3m^2$. The space should be ideally completely dark besides two spotlights which are pointing on the visitors faces. So the spotlights are located on the left and right side of the screen, as the visitors are usually looking into the screen.

music:

Mostly for copyright reasons, we have a music loop (hear in the video) which comes with the seidesein installation (composition and production by Tim Hoffmann). However other music for moving around is of course also fine.

duration:

There is no fixed duration if one takes the looped music.

ongoing maintenance:

the gametrak interfaces are mechanical instruments and may be due to damage, they are quite robust, but still - the installation should be checked lets say at least daily.

specific equipment required:

- a Linux PC with a decent graphics card and processor (GForce 6600, Intel Pentium 4 with 3 Gigahertz with hyperthreading or better)
- a Java Runtime Engine with installed JOGL (Java OpenGL) bindings and JMF (Java Media Framework) and jinput on that PC
- two gametraks (by the company In2Games)
- two webcams – maybe on tripods (we used Labtec Webcam Pro, but there should be no problems in using other webcames which run under Linux)
- a video projector
- two spotlights
- a cd player for the music with repeat function or the PC has additional capacities for the music (playing an mp3)

costs: cost depends on whats there already: A PC including graphics card suitable for the installation costs about 700 Euro, the webcams 20 Euros each, the gametraks 80 Euros each, price of spotlights and videoprojector depends on quality.

daily maintenance:
start-up is very easy - just start the program and switch on the lights and beamer. the program runs very stable (we used it for hours with no crash), so maintenance is not necessary.

installation:
We do not need to be present at the installation. However the installation of the program should better be done by someone who knows Linux and Java.

shipping:
It makes no sense to ship the technical components outside a from-Berlin-reachable-by-car-radius. The seidesein software comes on a CD.

Technical comment

It was important to us to have our piece run on a rather "cheap" environment, since we wanted it to be used also out of an gallery context. seidesein doesn't need a video projector, it can be perceived also on ordinary screens. Our piece runs currently on a middle sized graphics card, the computer (including graphics card) is a PC for about 700 Euro. The webcam is about 20 Euro. The gametrak costs about 80 Euro. So seidesein works on a consumer PC setup. However in principle it runs also in a 3D virtual theatre (like a CAVE environment).

For achieving the graphical performance we had to incorporate general progamming gpu techniques for hardware accelaration. The graphical rendering software which we use is called jReality. It has been developped by a group of mathematicians and computer scientists including Tim. jReality is a follow-up project of jScene a graphical rendering software written entirely by Tim. jReality is currently e.g. used for the 3D visualization of the Mars images of the European Mars Express expedition. It is publicly available under a BSD open source license.

For the hardware acceleration a jReality shader was used that allows integration on the graphics card. This shader was mainly written by Steffen Weissmann for

his Diploma thesis in math and we want to thank him here for helping us to adapt it to our work.

The physical model for the virtual veil (i.e. the physical appearance of the virtual veil and the way how the veil moves in response to input data) was created by us, as well as the reactive background (the dirt particles, which can be stirred) while having our metaphors in mind.

For displaying seidesein in an installation, one could also put two users in different rooms, rather then put them next to each other, as proposed for an installation. Both variants have their own merits and have their interesting implications. In an ideal installation the user could explore the different variants. We have sofar not implemented the connection of the datastream via a network. This is in principle no problem but rather a question of (human) ressources.

As shown in the video using a video projector for seidesein is ideal for a public audience, but screens work also well. In short: we would adapt our work to the possibilities. seidesein is an artistic "tool", i.e. it should be usable in different ways.

Biographies

Tim Nikolai Hoffmann

Tim Hoffmann had been trained as a mathematician (PhD). In his art works he investigates the intersection of mathematics, physics and human perception and cognition. He is a main developper of the 3D open source software project JReality and part of the ''Mathematics in virtual realities'' group at the Technical University of Berlin. His works have been featured e.g. pong.mythos 06, Javamuseum 04, soundtoys 05. Sofia Computer Space Festival 03 Together with Nadja Kutz he forms the daytar group. Tim is member of GEMA and publishes here and then pop music.

Nadja Kutz

Nadja Kutz had been trained as a mathematical physicist (PhD). In her art works she investigates the intersection of mathematics, physics and human perception and cognition. Her works have been featured e.g. at Media Arts Festival Bangkok 05 and 06, Electronic Language International Festival, Sao Paulo 06, pong.mythos 06, Javamuseum 04, soundtoys 05, dvblog 05, Sofia Computer Space Festival 03, New York Museum of Science 01. Together with Tim Hoffmann she forms the daytar group.