A Horizontal Stereoscopic Projection System for Working at the Artist Studio & Mimesis, the Function that Made the Organ

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Abstract

Stereoscopy is a very strong emotional and esthetic factor in visual arts and can be greatly explored using stereoscopic projection systems. However, due to their high cost these systems are very restricted to artists. In this sketch, I describe a horizontal stereoscopic projection system, inspired in the "Responsive Workbench" (GMD, Germany) and the "Taula estereoscópica" (UPC, Spain), that is low cost and can be set up in a small studio. In addition, this system has advantages over vertical projection systems as it is shown in Mimesis, the function that made the organ.

1. Introduction

Working with stereoscopic computer graphics is difficult and expensive for independent artists. The usual solution is to work with a stereo graphic card, shutter glasses and a high refresh rate computer monitor. This approach has two main inconveniences: the reduced size of the computer monitor and the low performance of the graphic card in stereo mode. The first problem is well known and is associated with the nickname of "fish tank VR", used for systems that are classified as non-immersive Virtual Reality. The second problem limits the imagination of the artist working with real time graphics, making her main concern the amount of polygons and consequently constraining the geometry of the environments. I describe a projection system that solves both problems at a low cost and with high quality graphics. Additionally, this system is very portable and functional and can be set up in small studios, labs or art galleries.

2. Description of the system

The hardware requirements to build the system are two LCD/DLP portable projectors (with keystone correction), a computer graphic card with two VGA outputs, two polarized filters, polarized glasses, a methacrylate plastic screen and a mirror. The graphic card sends the separated left and right eye views to the two projectors, which are set up one on top of the other with their corresponding polarized filters. The mirror is set up in a 45º angle. A methacrylate screen is used as an alternative to the very expensive special screens required for polarized rear projections.

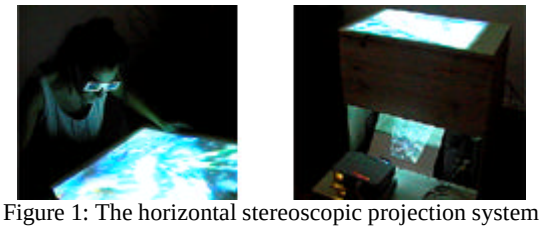

Figure 1: The horizontal stereoscopic projection system

In addition to its low cost and portability, this system has proved to be more comfortable than vertical stereoscopic projection systems for virtual environments that require an intensive interaction. This is the case in Mimesis.

3. The artwork: Mimesis

One of the challenges in designing a virtual environment is to find a universal language to articulate the communication between the user and the environment. This language should be able to become a rich set of metaphors that will weave the narrative of the environment. If this language does not exist, or if it is not intuitive or flexible enough, the evolution of the environment through the user's presence and actions will be boring, painful or even impossible.

In Mimesis I use mimetism, an interesting coevolutionary phenomenon of nature known in every culture, as the basic language to articulate the narrative of the environment and the user's interaction. Mimetism has very popular and well known representatives such as the chameleon and has even been the subject of Woody Allen's pseudo-documentary film "Zelig" (1982), about a type of "human chameleon". On the other hand, mimetism is a high specialized phenomenon of nature that is studied in Evolutionary Biology through such interesting cases as the mimetic octopus, the viceroy butterfly and orchids.

Mimesis is a mimetic environment initially inhabited by microstructures with familiar bonds. Each microstructure is associated to a matrix with a set of characteristics that define its dynamics, as well as its appearance and sound. Users can organize the microstructures establishing mimetic relationships to create macrostructures. The macrostructures will have their own behaviors, visual and sonorous characteristics, based on the combination of the microstructures that form them, and will interact with each other at a more complex level of mimetism.

The user has to focus to manipulate the inhabitants of the environments (selecting and moving them or reconfiguring their components). Thus, it is very functional to have a horizontal stereoscopic display system. Such system works as a portable workbench laboratory helping users to work comfortably and to easily understand the 3D space.

There is no doubt that stereoscopy is very useful for understanding space. Indeed one of the most established theories for explaining the development of stereoscopic vision is based on the adaptation of mammals to the arboreal life, in which an intuitive and fast perception of space is necessary for survival. On the other hand, stereoscopy has proved to be a very strong emotional and esthetic factor in visual arts, and it is a very exciting technique for exploring spatial effects that otherwise are impossible to achieve, particularly in computer graphics.

Figure 2: Macroestructures of Mímesis

Mimesis is like a portable workbench laboratory in which artists and users can enter a magical well full of life, whose virtual space can be turned inside out beyond the screen.

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