

 **FIVE ROOMS**

The Five Rooms Project

The Assignment

If an artist is given the task of graphically designing a surface, then he is also left to decide which creative processes will be active and which criteria will then have to be followed to achieve a certain result. Here, it has to do with aspects such as design and color, or the abstraction of a graphical idea. A graphic that is completed is primarily based upon a system of construction with whose help the graphic artist approaches his concept of an image.

The question with which the experimental computer application called «Five Rooms» concerns itself is in how far such a generative system, even if highly simplified, can be broken down into a network of individual processes and dynamically automated. In the five rooms, the software takes over the task of continuously generating graphical structures. As a client, the user prescribes the basic conditions here. In this way, the operator has the option of setting in motion the performance of individual design processes and bestowing individual degrees of freedom to different creative aspects. The five design parameters of color, substance, position, inclination, and abstraction are the basis of the experiment. Each is currently assigned to its own particular system from partly definable and partly calculated values and continuous processes.

The fundamental problem underlying this project was how all of these various design possibilities could be made available within an integrated, easy-to-use system so that the control of generative processes would be clear and easy to learn. A graphical interface between the software and the user was developed resulting in an elegant, intuitively useable, three-dimensional interface following a simple idea: the principle of Attractors.

Structure

As the name already indicates, the entire structure is divided into five separate rooms, each of which currently deals with one of the five cited motifs. In each of these rooms, a system is also installed that

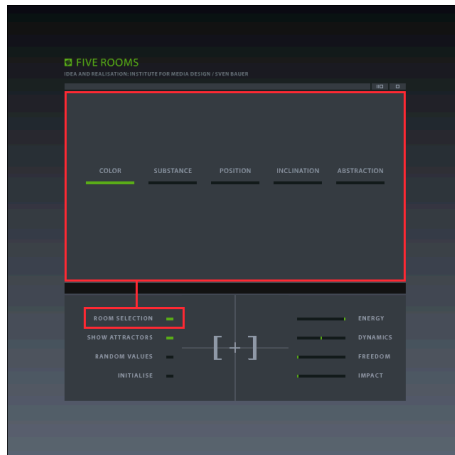


Fig. 1 Room Selection

has direct influence upon a globally accessible two-dimensional graphic within the programme. This graphic is always found in the same position in the center of one of the six walls in each of the rooms that are currently arranged in the form of cubes.

Switching between the rooms is accomplished by using a menu which can be inserted with the click of a button (Fig. 1). In the center of a chosen room, a cube <hovers> which, depending upon the selected motif, is colored in different ways. Around this object, each one of three small points of light marks one of the three axes of the room. These points of light are the Attractors which constitute a central element within the virtual world. Since there are three Attractors per room, there are a total of 15 Attractors whose function will be further clarified below.

Control

Each system can be directed by using a row of permanently visible control elements as well as by certain mouse movements over installed buttons. In this way, important global and object-related parameters can be set and controlled at any time.

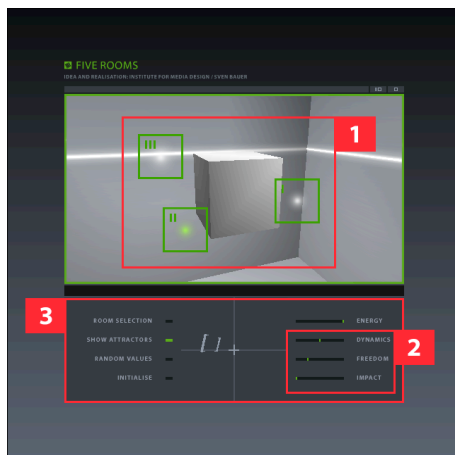


Fig. 2 Selection and Settings

The primary tools for generating moving structures are the three Attractors. They can be chosen with a mouse click that <freezes> all motion in the room, and inserts the buttons associated with the Attractors (Fig. 2, Panel 1) as soon as the mouse pointer moves across the viewing window to the virtual room.

After the desired Attractor has been selected, three parameters can be assigned to it by using sliding scales (Fig. 2, Panel 2) that determine its behaviour and actions.

DYNAMICS, the first parameter, sets the primary speed at which it circles the cube located in the center. At first it follows an orbit whose radius is formed by the original position of the Attractor and the centre of the room. FREEDOM determines the degree of freedom of movement that an Attractor can be assigned. The higher the value that is set, the more <capricious> are its movements and the less it

follows a discernible orbit. Using IMPACT, the operator determines the degree of influence of an Attractor upon the object that it circles around. Besides the functions that primarily relate to the characteristics of Attractors, there are also those that act globally. Using ENERGY, the entire setting, including all of the rooms, can be slowed down or even brought to a complete halt according to the desires of the user. SHOW ATTRACTORS determines whether the Attractors are visible or not, but otherwise has no effect upon them. The command RANDOM VALUES generates random parameter settings for those Attractors that are in the room, and INITIALISE resets all assigned values.

Input

The user may use different control elements to insert individual values. On the left half of the permanent control panel (Fig. 2, Panel 3), two switches can be found (ROOM SELECTION and SHOW ATTRACTORS) that only set states as being «active» or «inactive.» Clicking on a switch causes flipping between the two options.

In addition, there are two buttons below these switches, and two on the right above the viewing window (Fig. 3), that produce a certain outcome when clicked upon (for example, an initialization or resetting to default values).

The right half of the control panel presents four sliding scales with whose help values in a given range can be selected. This is done by simply clicking here with the mouse in the active region of the desired control, holding down the button and dragging the pointer in the direction in which the current value is to be changed. Being farther away from the original position where the button was held down makes the value rise or fall faster.

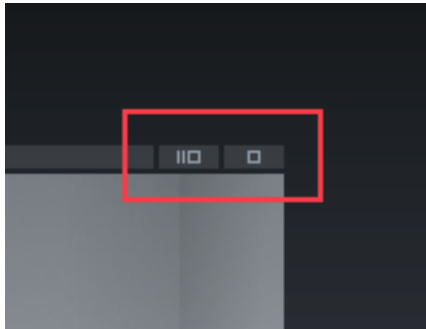


Fig. 3 Default or Initialization

References

In addition to the usual highlighting effects that indicate if a menu pointer or tool can be chosen, and indicators that show the position of a switch or the set value of a parameter, the programme automatically offers a text Help option. This Help is displayed above the control panel as a single line text display which is independently updated, depending upon the instantaneous mouse position, and provides the user information about possible actions.

Navigation

An innovative navigation tool allows the user to move through the room by infrequently using the mouse. Three principal methods for rotation or translation are available for this purpose. One is the



Fig. 4 Navigation Tool

option of navigating around the centre of the room on an imaginary sphere. Next, the distance from the observer to the centre of the room, and therefore the radius of the navigation sphere, can be decreased, and finally, the option of rotating the viewing direction horizontally. As long as the latter method is not invoked, the view always remains directed on the centre, independent of movement in the room, highly simplifying navigation.

A stylized viewfinder that moves over a set of crosshairs corresponding to the spatial perspective data is used as an optical reference for the current position and orientation of the observer. Movements are accomplished by clicking in the region of the crosshairs (Fig. 4) and moving the mouse, or, with the button held down, by dragging it along the x- or y-axis.

Design

If the IMPACT control is moved, then the value that is set determines the effect of the chosen Attractor upon certain characteristics of the cube. The current room motif determines which characteristic is influenced. For example, if the operator is in the COLOR room, then IMPACT regulates color, which an

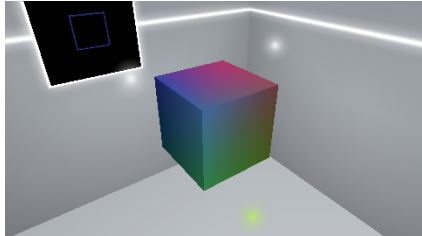


Fig. 5 Values Mix

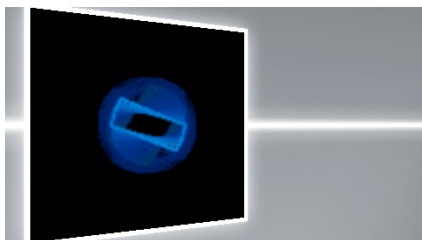


Fig. 6 Systems Cooperate

Attractor, within its region of influence, transmits to the surface of the cube. If the Attractor moves, then the tinted region also moves, and the surface becomes «alive.» Since all of the values can be defined independently of one another, complex, dynamic mixtures quickly result (Fig. 5). If the operator changes to another room, then the meaning of the value that was defined using IMPACT also changes. For example, if the motif SUBSTANCE was chosen, then IMPACT specifies the region of influence of the Attractor, which now can be used to break apart targeted sections of the cube. As was mentioned at the beginning, each room hosts one of five systems that are each dedicated to a certain creative aspect. With the help of the object which originally has the clearly defined shape of a cube and which was generated in the centre of the room, the degree to which individual attractors affect the current design parameters can be seen. The aggregate of all the component systems, that is, the sum of form and color linked with every distinct successive movement, is again reflected in the graphic that is visible in every room. In this way, the color of the «color cube,» as well as the motion of the perhaps frantically rotating fragments of the «rotation cube,» is immediately transferred to the graphic (Fig. 6), which at first depicts nothing more than a rigid square composed of white lines.

Plane

Complementing the navigation is the option of having the two-dimensional creation projected in the viewing window at a higher resolution over the entire area.

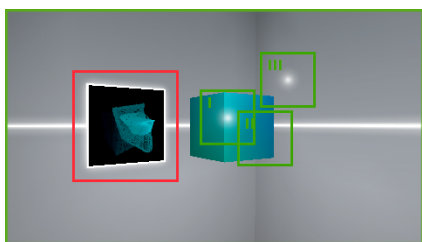


Fig. 7 The Fourth «Switch» in a Room

When entering a room, this is done by simply clicking on the graphic located on the opposite wall behind the central object. This however works only if «the path is clear» that is, when there is no object and no Attractor button between the mouse pointer and the image (Fig. 7).

If the image is brought into the window, the close-up view can be easily deactivated by clicking on the graphic. This function is only available as long as the application is not running in the software rendering mode (perhaps active among older graphic controllers).

Technical

To keep the project as portable as possible, and to allow the software to run in the web browser, the software is based completely on Macromedia's authoring environment called «Director», which permits the export of the programme as a «Shockwave» application. Using the Shockwave player makes it possible to run the application in every current web browser. For the current operating system, the plug-in can be found as a free download on the Macromedia web site and should be installed in at least Version 8.5.1 on the appropriate browser.

For a smooth and a faithful color rendering of the application, a computer that is as fast as possible, with a graphics card that can be run in a true color mode, is required.