

Aesthetics as a Medium

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Virtual reality, telepresence, haptic devices, advanced networks and surround sound offer greater means to visualize the complexity of the world and create new conceptions of reality and identity. These new conceptions expand traditional aesthetic principles of art making into other dimensions in depth and time requiring new aesthetic principles.

This text describes the relationship between traditional and digital aesthetics in the virtual reality art project *Rutopia 2* built for the CAVE™ and C-Wall virtual environments. The project explores the aesthetics of virtual art in relation to traditional Russian folk arts and crafts such as wood sculpture, toys and the decorative painting styles of Palekh, Khokhloma, and Dymkovo (Figure 1). Their crisp easily recognizable style of expression is characterised by generalized outlines, crisp emphasized details, bright colours, subjects, materials, and forms. *Rutopia 2* generalizes those aesthetic principles and transmits their culture into virtual reality (Figure 2). The project studies how the aesthetics can affect the intuitive navigation, perception, and emotional experience of the user inside the virtual environment. Computer graphics techniques used for the real-time development of virtual artwork study how colors

and shapes can influence and lead the navigation and interaction of the user in the virtual environment. The research of user's perception and emotional experience gained from immersion and interaction with aesthetics of the virtual environment teaches that aesthetics can induce and control emotional responses. The aesthetics of the virtual environment can be orchestrated to control the communicative power of the project, maximize a sense of immersion and ultimately "presence" in the virtual world.

Rutopia 2 describes a magic garden with interactive sculptural trees. It was conceived as a virtual environment linked to a matrix of other unique virtual environments that together create a shared network community. A series of 3D modular sculptural trees, each consisting of dozens of rectangular screens, appear in the main environment and serve as portals to the other linked environments. Users can "grow" three trees in the island world by moving within the proximity of each tree. Once all the trees are fully grown, their screens turn into windows each showing the view of the remote environment connected to it. The user can look through each of the screens to see remote worlds consisting of imagery found in traditional Russian fairytales and folk



Figures 1 & 2: Storyboard of *Rutopia 2* from original painting inspired by Russian folk arts and crafts (Left, 2005). Screenshot from the virtual environment in *Rutopia 2* (Right, 2007).

art. By moving his or her head completely through one of the virtual screens, the user enters the connected environments. The project implementation utilized OpenGL Performer, Maya, CAVelib™, the Bergen spatialized sound server and the recent improvements and advanced rendering techniques in Ygdrasil.^{1,2}

The rich tradition of 2D and 3D art history informs the visual composition, technical and aesthetic evolution of virtual reality environments. Balance, color, repetition and rhythm principles expand into new dimensions in virtual reality and require more planning, work, development time, testing, and evaluation. In order to have a visually pleasing image the overall scale and the proportion of each element needs to be balanced. By connecting multiple elements through the same properties of color and proportions, one can effectively highlight the connective relationships. Because the human eye tends to lose concentration on details in the moving image proportionally to its speed the time-based moving image requires less detailed artwork. Looking at the fast changing images on the screen, we seek the familiar and common artistic features to understand the overall art style. Thus, each individual moving image must follow the overall style guidelines while permitting a lower level of details.

Color can be successfully used to guide the user by forcing the eye and mind to focus on a specific element, which can be placed in the environment so it contrasts in color or brightness with other elements. Therefore color can be used to influence and lead navigation of the user inside the virtual reality. The decorative patterns, bright colors, and simplified 3D shapes can enhance the intuitive navigation in virtual reality. The bright orange decorative roads painted in contrast with the dark terrain colors in *Rutopia 2* guide the user in the environment. They lead to the log house where the user receives the ability to fly and to the island where he can “grow” trees. In virtual space the element can be both static, while it waits for the user commands, and moving when it is animated through interaction. The compositional and color emphasis in the virtual environment is placed not only in three dimensions: depth, width and height, but also into a certain moment in the project timeline. This adds a need to control its impact range on a time-based sequence.

The greater potential of aesthetics in virtual reality is not only to visualize the objective similarities and recreate photorealistic effects, but also to provide interactive activities to discover the meanings of

the artistic concepts. Virtual reality can embody an authentic aesthetic experience, sense of “place”, unveil metaphorical meanings and manage feelings, emotions and perceptions to communicate conceptual context. It provides unique means to highlight and reveal the cause and effect relationships between meaning and the interaction necessary for deeper comprehension. This user-centered approach controls a user’s engagement. Through navigation, interaction and user involvement, virtual reality can enhance the meaning of the experience, and foster discovery through exploration and sense of presence. In a networked situation, visitors can communicate with each other and collaborate on the discovery of metaphors associated with the concept of a project. Another new requirement for a new aesthetic is based upon their physical and psychological influence on the human body inside the virtual reality world. Body movement in the immersive environment can extend to the exploration of design in a more imaginative, unconventional and emotional way.

Acknowledgment

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<http://www.evl.uic.edu/>
<http://www.evl.uic.edu/animagina/rutopia/rutopia2/>

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- 1 Pape D., Anstey J., Dolinsky M., Dambik E. 2002. “Ygdrasil—a framework for compositing shared virtual worlds.” In *Future Generation Computer Systems, Special Issue IGRID 2002*, pp. 1041-1049.
 - 2 Tsoupikova D., Hill A. 2007. “Development of Rutopia 2 VR Artwork Using New Ygdrasil Features.” In *GRAPP 2007, International Conference on Computer Graphics Theory and Applications Proceedings*. Portugal: INSTICC Press, pp. 225-228.