

## Chapter 4

# Aesthetics in the Context of New Media Art and Knowledge Visualization

### ABSTRACT

*This chapter discusses aesthetic values in mathematics, science, and computing including aesthetic computing and aesthetic issues related to digital environment. A study of aesthetics has always been related to the arts, philosophy of art, and our judgments about sensory or emotional values of specific art works; they are in the focus of neuroaesthetics. The objectives of aesthetic studies have been changing following the developments in computing technology, shifting the stress on usability and efficiency of projects and visualizations. Challenges and demands in aesthetics and art are then discussed, starting from an essential question (What is an artwork and what is not an artwork?), and including art definitions, art manifestos, opinions on the role of art, beauty, and aesthetic perception of art. Aesthetic education and ways of looking at art complete the chapter.*

### INTRODUCTION

Studies on aesthetics relate to the arts, philosophy of art, and our judgments about sensory or emotional values of specific art works. They are also in the focus of neuroaesthetics. Visual aesthetics draws has been based on the artistic principles and investigated as part of cognitive science (Chatterjee, 2003, 2011a, 2011b; Kawabata & Zeki, 2004; Watson & Chatterjee, 2011; Ishizu & Zeki, 2011). Traditionally the aesthetic values included objects that were beautiful, harmonious,

or emotionally pleasing. Later on according to the concept presented by the postmodern philosopher Jean-Francois Lyotard (1924-1998), they would be sublime (Lessons on the Analytic of the Sublime, 1994). Then, with the broadened criteria of beauty, judgments of aesthetic values examined also social, political, moral, and many other aspects of the art objects. Modern analytic approach in aesthetics is no longer limited to just an analysis of natural beauty because, in opinion of cubists, dadaists, constructivists, conceptual artists, generative artists, and many others, beauty ceased

DOI: 10.4018/978-1-4666-4627-8.ch004

to be central to the definition of art. Computing science specialists examine aesthetics of electronic projects' usability, efficiency, and discuss aesthetics in terms of possible applications to controlling computer products. Evaluation of tag clouds in terms of the aesthetic quality obtained from an extensive user study confirms that aesthetic values correlate with product usability.

## **THE CHANGING MEANING OF THE AESTHETICS NOTION**

Opinions about aesthetic experience meant quite different things in different times. As described by Tatarkiewicz (1999), Pythagoras wrote in the 6<sup>th</sup> century BC about the aesthetic emotions sensed while appreciating plays and games. Greek philosophers valued cognitive value of aesthetics, while the 18<sup>th</sup> century writers identified the differences between sensory and intellectual responses to beauty. Other authors describe a variety of aesthetic experiences, such as sensual, non-associative pleasure caused by beauty, cognitive intellectual indulgence, irrational elation, or experiencing illusions: a viewer knows it is an illusion but enjoys it, contemplates, feels empathy, plays a kind of a game by watching a fictional world with fictional rules, switching his troubles off, and feeling emotions (Tatarkiewicz, 1976). In many instances artists impart similar impression related to their creative process.

American mathematician George David Birkhoff (1884-1944) proposed in a book entitled "Aesthetic Measure" a mathematical theory of aesthetics: in an equation  $M=O/C$ , Aesthetic Measure (M) is a function of Order (O) divided by Complexity (C). The Gestalt psychology theory of mind postulated that brain has self-organizing tendencies and recognizes the whole of a figure rather than its individual parts (Birkhoff, 2003/1933).

The aesthetics of the new media art is derived from its characteristics: being digital, networked, multisensory, immersive, or interactive. For ex-

ample, Creative Time and the Public Art Fund in New York and Artangel in London are weaving video projections, websites, and interactive installations into the urban fabric. According to Hansen (2006), new media artworks provide the aesthetic interface between the digital technosphere and our bodies, which is experienced interactively or virtually. The co-evolution of the human body and the digital technosphere goes through the radical aesthetic interface provided by new media artworks themselves; our bodies, when brought into contact with the digital, experience the virtual.

## **NEUROAESTHETICS AND THE COGNITIVE NEUROSCIENCE**

Investigation into the neural basis for perception of beauty in art evolved into a field of neuroaesthetics (Zeki 1999). Neuroimaging techniques enabling in vivo investigations of the human brain function include, among other techniques, fMRI - functional magnetic resonance imaging (through measuring changes in blood flow), PET - positron emission tomography, and near-infrared spectroscopy. Other techniques exist, such as electric (electroencephalography - EEG) and magnetic (magnetoencephalography - MEG). Research results obtained with the imaging and neurophysiological techniques suggest that the aesthetic experience of visual art works is characterized by the activation of sensorimotor areas of cerebral cortex, cortical emotional centers, and the reward-related centers (Cinzia & Gallese, 2009). However, external factors can bias the brain reaction to viewing art works and influence our aesthetic judgments. This fact might offer a scientific explanation as to why assessment of an artwork may depend on information about who the artist is, is this artist universally respected, and whether or not the work is shown in a renowned art gallery (Kirk, Skov, Christensen, & Nygaard, 2009). Possibly, we may soon encounter a new form of judging criteria based on a biofeedback

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