Visual Aesthetics and Its Effect on Communication Intent: A Theoretical Study and Website Evaluation

Kirstin Krauss

Abstract

Despite its centrality to human thought and practice, aesthetics has not played a significant role in human computer interaction (HCI) research (Lavie & Tractinsky, 2003:2). Traditionally, the field of HCI's main emphasis has been on efficiency considerations (Lavie & Tractinsky, 2003:3). Although aesthetics applies to all human sensory domains (think of bad tasting food, revolting smells, cacophonic music, or coarse clothing), this paper mainly addresses the visual domain. Because visual aesthetics exists in everyday life, and it influences many of our choices, it is difficult to justify its absence from web design (Lavie & Tractinsky, 2003:3). Designing a website of high aesthetic quality enables the active communicator to enhance the persuasive appeal of the message directed at the passive fellow communicator visiting the website. With my research I intend to foreground the importance of visual aesthetics in website design, so that it will become a prominent feature of successful website design. I will furthermore apply the theory to demonstrate how visual aesthetics has been applied in a specific case.

The Role of Visual Aesthetics in Website Design

The presence of web-based applications has generated a large body of research in web usability and human computer interaction (HCI) re-

garding the design of such applications. With a few exceptions though, research has neglected the aesthetic dimension of websites. In general, the aesthetic criterion should be an integral part of effective interaction design (Alben, 1996 as *cited* by Lavie & Tractinsky, 2003:11), especially when it is about effective communication. It has been argued that modern design has placed too much emphasis on performance issues and not enough on aspects like aesthetics. Studying the effect of aesthetics on communication intent has been totally neglected.

While Neale and McCombe (1997) as *cited* by Lavie and Tractinsky (2003:11) describe how to design a usable and visually appealing website, the emphasis is on the functional and the usability aspects of the design rather than on aesthetics. Similarly, Spool *et al.* (1999) as *cited* by Lavie and Tractinsky (2003:11) assess websites and draw guidelines based on usability as the sole criterion. Nielsen (2000:11) maintains that two basic approaches to web design exist: the 'artistic ideal' that reveals the designer's self-expression, and the 'engineering ideal' that provides solutions to users. From this one can conclude that the artistic ideal is not compatible with providing solutions to the user. However, Zettl (1999:4) clearly states that applying the "artistic ideal" or visual aesthetics is about the process of clarification, intensification and interpretation which serves to provide solutions.

Although "there is a need for art, fun, and [a] general good time on the web", Nielsen (2000:11) contends that "the main goal of most web projects should be to make it easy for customers to perform useful tasks…" Hence, clear and effective communication of ideas is the design principle to follow on the web (Lynch & Horton, 1999 as *cited* by Lavie & Tractinsky, 2003:11). While researchers divorce aesthetics from clear and effective communication, the irony is that, according to Zettl (1999), applying elements of aesthetics correctly could actually enhance communication and support the message.

It is important to apply principles of visual aesthetics correctly. The aim should be to support the message. If aesthetics is used in design but does not support the message or contradicts the intended communica-

tion, then a site may look beautiful but it has missed its goal and will be ineffective communication. In such a case aesthetics or beauty will be a disadvantage, making previous research true. The reason why authors possibly argue that aesthetics could hinder website effectiveness is because they do not understand visual aesthetics and its influence on communication success, or because they do not know how to apply aesthetic principles. The need for applying visual aesthetics also did not arise given the history of low bandwidth and traditional ways in which people used the Internet up till now.

This is the aim of this study: to help the reader realise the importance of visual aesthetics in website design and understand how visual aesthetics can be applied to support the intended message. Obviously visual aesthetics cannot be applied effectively in all cases and does not play a role in all websites, but in certain cases the message or intended communication will benefit from applying visual aesthetics. Examples will be used to explain the value of visual aesthetics and its application in websites.

Overlooking communication concerns, Lavie and Tractinsky (2003:29) relate aesthetics to various other website quality issues. Lavie and Tractinsky (2003:29) note that recent research suggests that aesthetics is the primary factor affecting other perceptions. Aesthetics is related to pleasure and perceived usability. Findings are that perceptions of aesthetics and usability are highly correlated (Kurosu & Kashimura, 1995; Tractinsky, 1997; and Tractinsky *et al.*, 2000, *cited* by Lavie & Tractinsky, 2003:17). The results of Lavie and Tractinsky (2003) not only confirm those findings, but they also shed light on the usability-aesthetics relationships. These observations are important and serve to provide perspective, but fall outside the scope of this study. It is significant, however, to note that they support the argument that dimensions of quality (including visual aesthetics) cannot be isolated from one another. For example, a company's website may have excellent usability but yet have no business case or useless information. Putting visual aesthetics into perspective of overall quality means that all

elements of quality (usability, aesthetics, download speed, information quality, to mention a few) should work in concert to produce a site of high quality.

Although Lavie and Tractinsky (2003) explore how users perceive aesthetics of websites beyond the general question of whether the site is attractive, this has limitations. Many adjectives are used to describe aesthetics, but the impact of elements of colour, screen vectors, close-ups, etc. (as described by Zettl, 1999) on the viewer's perceptions is not investigated. All that this study does is describe beauty/aesthetics using various adjectives. The "how" is neglected, e.g., having a site that is "energetic", "symmetrical" or "clean" (Lavie & Tractinsky, 2003:19) is important, but these aspects are the result of visual aesthetics applied correctly. How to create an "energetic" or "clean" site is not investigated and the effect of a "clean" or "symmetrical" picture on the user's perceptions is not addressed. The reader of such an article will therefore understand that it is important to have a site that is aesthetically pleasing but will still not know how to achieve this. Other limitations include that aesthetic measurement dimensions were isolated without taking into consideration the effect of social issues, user experience, attitude, language and culture. Although rigorous procedures were followed in the development of the measurement instrument, this article is limited in its evaluation of visual aesthetics. It is, however, a good starting point and is a valuable contribution to the body of knowledge.

Visual Aesthetics

Traditional aesthetics concerns itself with beauty and judging beauty but in more modern readings the aesthetic interpretation of beauty is associated with delight and perception (Feagin & Maynard, 1997 as *cited* by Lavie & Tractinsky, 2003). Lavie and Tractinsky (2003:3) explain that aesthetics is the importance of beauty. This study, however, expands the purpose of aesthetics in that it investigates its role in visual communication.

Zettl (1999) provides tools which assist the user to clarify, intensify and interpret events for television, computer and film presentation. He demonstrates how to apply elements of aesthetics to manipulate and influence people's perceptions. Applied media aesthetics considers art and life mutually dependent and essentially interconnected. People perceive aesthetics against the backdrop of their lives and experiences. The major function of visual aesthetics is based on the original meaning in Greek, which points to perception (Zettl, 1999:4; Lavie & Tractinsky, 2003:5). Even this fact has not prompted researchers to investigate visual aesthetics and its role in web design. Little has been done to relate visual aesthetics to website design and even less to learn how to clarify, intensify and interpret events for web pages. With media such as computer displays, you need to give your vision significant form so that you can share it with others (Zettl, 1999:3).

Aesthetics is not an abstract concept but a process by which we examine a number of media elements and our perceptual reactions to them. Film, television and computer displays are no longer considered a neutral means of message distribution but essential elements in the aesthetic communication system (Zettl, 1999:4). The process of clarification, intensification and interpretation is the domain of aesthetics. Although aesthetics impacts more than one form of sensory input (hearing, smelling, feeling), this study is limited to investigating visual aesthetics.

The various elements of visual aesthetics are contextual (Zettl, 1999:5) i.e. they interact to produce the final communication effect. Communication is more than just language and writing. We see our world as changing contextual relationships. Putting the same word or image in a different context could change the meaning significantly. Zettl (1999:7,8) notes that one should not underestimate the power of context. Many of our perceptions are guided by the context in which the event occurs. We tend to take notice of events or event details that fit our perceptual expectations or that interest us highly. Each of us sees

an event from our particular point of view and according to a specific experiential context (Zettl, 1999:7). Experience guides our perceptions.

Zettl (1999:8) asserts that some of our perceptual processes are so forceful that we respond to certain stimuli in predictable ways even when we know we are being perceptually manipulated. Sufficient consistency exists in human perceptual processes that we can predict with reasonable accuracy how people will respond to specific aesthetic stimuli and contextual patterns. This is the power of visual aesthetics, and consequently the power of the knowledge of how to apply visual aesthetics correctly.

By applying visual aesthetics you can help the viewer to see an event from different perspectives. You can advance him from a stage of merely looking at an event, to a stage where he obtains insight by looking into the event (Zettl, 1999:10). This is a process of getting the viewer involved in the message and using visual aesthetics to educate the viewer's perceptions. Creating these different perspectives basically means that you use various visual prompts that aim to build on the experience of the viewer. Each visual prompt creates a scenario (mental space or event) in the mind of the viewer. The difference between success and failure to communicate effectively depends on whether the designer has succeeded in making these visual prompts support the same communication goal. Knowledge on how to apply visual aesthetics correctly will assist designers in making visual prompts support the intended message.

Many communication researchers overlook the fact that the communication medium plays a significant role in the outcome of the message (Zettl, 1999:10). The medium is a structural agent. In some cases the medium is the message. Communication researchers and web designers should consider the combined effect of message and medium. Zettl (1999:11) states that once you are aware of the aesthetic characteristics and potential of the fundamental image elements (light, colour, space, motion, etc.), you can study how they operate in the context of a larger aesthetic field and combine them knowledgeably into patterns

that clarify, intensify and effectively communicate significant experience. Zettl (1999:12) summarises: "Once you have a strong grasp of applied media aesthetics, you can select those elements and techniques that are most appropriate for effectively shaping ideas or content."

The aim of visual aesthetics is to improve the communication situation (Zettl, 1999:123), but it can be associated with more than that. It is about the art of inducement, the art of persuasion. It has convincing powers. The aim of visual aesthetics is to persuade the viewer or user of the message and intensify communication, to support the message, to direct or influence the user within ethical boundaries to believe the message. Visual aesthetics has persuasive power because it alters the value and belief systems of observers. Visual aesthetics aims to create interest. Visual aesthetics can induce the user to unknowingly, unconsciously, and unsuspectingly choose to become involved in the message and the website of concern. This is achieved by involving the user in the communication process using elements of visual aesthetics in concert to support the intended message.

Ultimately the aim of visual aesthetics is to influence beliefs and actions. Here follows a brief explanation of how this happens. Humans have the tendency to seek ways in which to confirm rather than to refute existing beliefs. This will lead them to seek, interpret and even distort information in ways that verify first impressions or pre-existing beliefs. This tendency may hinder our appreciation of others and may also hamper our full understanding of the world in which we live (Sternberg, 1998:470). Beliefs and attitudes are therefore fundamental elements in the communication process. They not only aid or distort our understanding but influence our behaviour (Sternberg, 1998:472). Communicators must take them into consideration. Perceptions influence our beliefs while beliefs bias our perceptions. Hence, using persuasive communication, which is possible through applied visual aesthetics, beliefs may be influenced. Website users may be persuaded to change attitude, become involved in the communication process and ultimately believe the message. Since beliefs and behaviour are con-

nected (Sternberg, 1998:464) successful communication through visual aesthetics may influence user choice and behaviour.

Conceptual Blending

The study of visual aesthetics should be taken beyond statements that we persuade people by altering their values and belief systems. At this point I would therefore like to discuss a prominent theory of concept formation, known as conceptual blending, as a plausible account of how visual aesthetics works and how it contributes to human understanding.

Fauconnier and Turner (2002), the authors of the theory of conceptual blending, argue that a person builds a scenario of understanding or perception by blending or integrating different events or mental spaces (which may include existing experience or known events) and supplied inputs (e.g., a picture on a computer screen) through identification, integration and imagination. A blend creates a new event in the viewer's mind that communicates meaning. As is explained in the next few paragraphs, elements of visual aesthetics can create blends and it is important to let elements of visual aesthetics point consistently to the same meaning or message.

The purpose of visual aesthetics is to build an event that will influence and guide the human mind to construct meaning. Part of building meaning is creating context (Zettl, 1999:5). Incidents in life relate contextually, i.e., we perceive them in relation to one another. These incidents fuse to become an event of significance. Various fields of applied media aesthetics are contextual – they must interact to produce the final communication effect. Many of our perceptions are guided by the event context and this should be an important part of the design process.

Fauconnier and Turner (2002:17) argue that general operations exist for the construction of meaning regardless of the type of person that is involved. These basic mental operations are highly imaginative and produce our awareness of identity, sameness and difference. Framing, analogy, metaphor, grammar, and commonsense reasoning play a role

in the subconscious production of apparently simple recognitions and work no differently in people from different disciplines, ages, social levels and degrees of expertise (Fauconnier & Turner, 2002:18). Conceptual blending is highly imaginative and crucial to even the simplest kinds of thoughts. In this study, the focus is on how visual aesthetics prompts conceptual blending by the creation of visual input spaces that lean on the experience and knowledge of the viewer to construct meaning.

The full details about conceptual blending and the science of cognition in general, are beyond the scope of this contribution. What is important, however, is the fact that conceptual blending does occur in the minds of people who experience things, and that through the effective use of visual aesthetics one can take advantage of this human ability to create meaning or intensify a message. A website should be designed in such a way that elements of visual aesthetics create input spaces in the minds of users that collectively intensify the message and create the blends of new understanding that the site wants to communicate. If all input spaces emphasise the same message, they have succeeded in intensifying the message significantly.

Two examples in visual aesthetics I wish to refer to are the use of *vectors* (Zettl, 1999:106,132) and *psychological closure* (often just abbreviated to *closure*) (Zettl, 1999:101). I'll start with closure. Zettl (1999:101) describes psychological closure: "…in our quest for perceptual sanity … we continually seek to stabilize our infinitely complex and often chaotic environment. It is our tendency to mentally fill in gaps in visual information to arrive at easily manageable and complete patterns and configurations. This perceptual activity is called psychological closure."

We take the minimum number of mental cues and mentally fill in the missing information by applying psychological closure. Visual cues provided can be seen as input spaces. Mentally filling in the gaps are other input spaces compiled from previous experience and known information. Merging these input spaces into a new message is concep-

formation. Merging these input spaces into a new message is conceptual blending. Through conceptual blending we are therefore completing the picture and creating new meaning.

Figure 1 – Inferring a row of similar houses

Figure 2 – Inferring a single house

In Figure 1, the viewer can't help seeing a row of similar houses. It is because the message is completed in the mind of the viewer through psychological closure. In Figure 2, the viewer only "sees" one house. It is because there are no visual cues that prompt more understanding from the picture, as is the case in Figure 1 (Photo from www.property24.com).

Figure 3 – Inferring a continuous horizon

tures to each other. Since the vector "continues" from one screen to another it forces us to relate the two pictures in our mind. The resulting meaning is created from two different pictures and forms one picture or message in our mind.

Figure 4 – Inferring separate horizons

In Figure 3 (photo from www.news24.com), the horizon acts as a continuing vector in all three pictures. The result is that the viewer perceives the three pictures as a single unit or a single message. In Figure 4, the graphic vectors intersect at different vertical levels, making it difficult to perceive the three pictures as a single unit.

The success of visual aesthetics depends to a large extent on the human ability to construct meaning. Visual aesthetics depends on the human ability to complete a picture, identify a scenario, relate and other high-order thinking skills. The ability to construct a new conceptual blend from what a user sees on a website and what he knows, makes it possible for designers to create a new picture in the viewer's mind using visual aesthetics effectively.

Importance of Knowledge of Visual Aesthetics

I want to spend some time examining an article investigating a scenario that cries out for knowledge of visual aesthetics and conceptual blending. Klett (2002) sheds on the importance of visual aesthetics in web-based learning environments, but discussed this under the topic of visual communication. In fact, the word "aesthetics" is mentioned once in the introduction to the article but is never elaborated on. The conclusions arrived at relate in many ways to those of Zettl (1999). As in

other literature, the need to study visual aesthetics for the web is insinuated, but the "how" is addressed in little detail. Readers will know that having an interface that portrays unity, harmony and consistence (Klett, 2002:43) is important, but guidelines on how to achieve this are not addressed. Designing a 3D learning environment that limits "cognitive overhead" (Klett, 2002:44) is recognised as important, but the detail of what goes on in the mind of the user and how to facilitate understanding through visual aesthetics is not dealt with significantly. I believe that my research will answer some of the above questions. The reader should, however, keep in mind that at no point is it suggested that this is a comprehensive study addressing ALL issues related to cognition and visual aesthetics for the web.

Writing from the perspective of web-based learning, Klett (2002:38) notes that the support of intelligent interaction between system and learner evolves to a communication issue between author and learner. Hence, there is a need for knowledge of visual aesthetics and its impact on communication success. With any application, the learning system design acts as major factor in the learner's perception, satisfaction, and results. "The problem with shaping learning systems originates in the communication irregularities between author and learner. It can be solved by a competent user interface design" (Klett, 2002:38).

"Visualization concerns the visual representation of data, objects, and systems in order to enhance communication and thus understanding. The visualizations in the Ed-Media (Ed-Media is a virtual learning space studied by Klett, 2002) content library contain 2D and 3D models, 2D and 3D animations, virtual reality worlds and simulations, which effectively support the imaginative process, and spatial knowledge acquisition, allowing the learner's immersion in a hidden world" (Klett, 2002:39). Knowing how to apply visual aesthetics and its effect on the viewer will help to address these objectives as noted by Klett (2002). Visualisations have been described as the most important aid in providing information as well as supporting the learner's knowledge

construction process (Klett, 2002:40). By applying visual aesthetics, visualisations can be created that can be used to teach in a virtual learning environment successfully.

Klett (2002:40) notes that visualisations, which guide the viewer's eye to unimportant parts of the image, may cause significant parts to be overlooked or ignored . This confirms the statement of Zettl (1999:57,123) that elements of visual aesthetics should work in concert to support the message, otherwise it is ineffective communication. The power of context (Zettl, 1999:7) is confirmed by stating that related objects are recognised faster (Klett, 2002:40).

In terms of cognition, the need is expressed but the effect of elements of visual aesthetics on the message is not investigated in much detail (Klett, 2002:43). This supports the need for my research. This article shows that to a certain degree visual aesthetics have been addressed in literature but not as comprehensive as is the case with Zettl (1999).

Research Methodology

Empirical research with an interpretivist approach draws on experience or primary evidence in order to understand a phenomenon. It basically means to learn from experience rather than from making conclusions based on averages (Remenyi, 2004). Taking a critical stance to current perceptions of researchers on the role of visual aesthetics for the web is a further agenda of this study. It proposes a new way of thinking and challenges current ways of perceiving and explaining visual aesthetics for the web.

In an experimental approach, Lavie & Tractinsky (2003:8) report that progress in understanding aesthetics can only be achieved by isolating and manipulating elements (e.g., polygons) or artistic characteristics (e.g., complexity and "interestingness") of works of art and studying their effects on the observers' preferences (Swede, 1994 and Martindale *et al.*, 1990 as *cited* by Lavie & Tractinsky, 2003:8). However, some of the strongest criticisms of using an experimental ap-

proach point out the importance of perceiving whole objects or mean-ingful forms rather than isolated elements (Arnheim, 1992 as *cited* by Lavie & Tractinsky, 2003:9). These criticisms imply that elements of aesthetics cannot be measured using experimental methods because the whole may exceed the sum of the elements (Osborn, 1968 *cited* by La-vie & Tractinsky, 2003:9). Similarly Arnheim (1988), *cited* by Lavie &Tractinsky (2003:9), argues that dynamic forces, rather than "things" or isolated elements, determine our aesthetic experience.

Supporting an exploratory approach, Fauconnier and Turner (2002:4) note that our time has seen enormous amounts of energy de-voted to the discovery and manipulation of meaning through systematic analysis of form. This could lead us to think that scientific knowledge is only a matter of finding deep hidden forms behind perceived forms. On the other hand, common sense tells us that form is not substance, an average is not a holistic view, and a roadmap is not a path. Research indicates that users' interactions with computers are essentially social, and that their responses resemble responses to social situations (Reeves & Nass, 1996 as *cited* by Lavie & Tractinsky, 2003:3) and working with a concept of averages is far too general to do justice to the subjec-tive variety of an individual life (Jung, 1995 as *cited* by Remenyi, 2004). Human perception and conceptual processes occurring in the minds of people cannot be fully explained by numbers and systems. Fauconnier and Turner (2002:5) state that form or quantitative work does not present meaning but rather picks out regularities that run throughout meanings.

An example where quantitative analysis is inadequate is its ability to explain the process of analogy. Analogy has traditionally been viewed as a powerful engine of discovery (Fauconnier & Turner, 2002:14). In the age of form it was disregarded. Analogy seemed not to be precise compared with axiomatic systems, rule-based production systems or algorithmic systems. Analogy was reduced to the status of fuzzy thinking or sheer intuition. The absence of formal systems for analogy and to explain analogy was mistakenly associated with the ab-

sence of analogy as a fundamental cognitive process. Analogy was not considered as a method of discovery and explanation. Analogy, however, as a cognitive process, is an intricate, powerful and fundamental process (Fauconnier & Turner, 2002:14). Research relies on analogy as a means of analysis and explanation. As the limits of a formal approach to explaining and presenting analogy became evident, it was recognised that it posed a challenge to the researcher.

Subconscious introspective abilities, which present similar challenges, are abilities to identify, integrate, relate and recognizing sameness and difference. Others include framing, metaphor, grammar and commonsense reasoning. Using these mental operations in research should be recognised as suitable as long as the researcher acknowledges a subjective point of view. In doing research that investigates issues that impact human perception and that influence cognitive processes, it is necessary to pursue a research methodology that is relevant to the nature of the field of study. Although reactions and perceptions resulting from applied visual aesthetics may, in most cases, have a similar effect on the message received by different people, this type of research is subjective since it comprises observations made by the researcher through the process of analogy and identification. It is, however, likely that in some cases people from different cultures and backgrounds may perceive certain elements of visual aesthetics differently in terms of the impact on the message. Using the interpretation of colour, for example literature shows that different colours have different meanings for different people (Mathews, 1999:3). However, it is expected that the combined effect of the impact of elements of visual aesthetics on the viewer will convey the intended message (provided that these elements collectively support the intended message).

The impact of visual aesthetics mostly has similar effects in different cultures (see Zettl, 1999:97, about the use of diagonals, for example) and in some cases it cannot be explained why. (A possible explanation emerges from Klopper's [1999] writing. In his article on how humans perceive reality, Klopper notes that humans build up concepts

about things around them by combining basic image schemas like *point, line, centre, periphery, circle, square, triangle, long, short, horizontal, vertical, diagonal, close proximity, distant proximity, in front of, behind, smooth, coarse, regular, irregular, move, rest, source, route/path, target,* etc. These image schemas emanate from our physiological makeup and our vertical orientation when we are active.)

Using www.exploremarsnow.org as an example, I shall highlight and explain how visual aesthetics was applied to support the intended communication of the website. By applying principles of conceptual blending (explained by Fauconnier & Turner, 2002) I will explain and predict how elements of visual aesthetics for television and film (explained by Zettl, 1999) may have similar impact on the perceptions of viewers in the online visual communication environment. The reason for using examples to explain the phenomenon of visual aesthetics is because analogy and metaphor are powerful methods of discovery and explanation (Fauconnier & Turner, 2002:14).

In no manner do I claim to have addressed all elements of applied visual aesthetics for the web or the importance of certain elements above others. What is true of this research is that it aims to explore visual aesthetics for the web and lay the foundation for future research with specific emphasis on the impact of visual aesthetics on communication intent. It tries to highlight the importance of recognising such a field of study by referring to examples and learning from what is being done in film and television production (Zettl, 1999). Not all elements of visual aesthetics have been used in the provided example and this study is not comprehensive.

Theory Application and Discussion

Although some screen shots from the website will be provided I advise that the reader interact with the site www.exploremarsnow.org, since the next few paragraphs evaluate the site for applying visual aesthetics according to the criteria proposed by Zettl (1999) and using principles of conceptual blending (Fauconnier & Turner, 2002).

The major intention of www.exploremarsnow.org is to subtly encourage the user to become involved in the communication. Apart from having quality information for many users and having a site that is relatively easy to use (Nielsen, 2000:380), various elements of aesthetics have been applied that make this site a success in terms of visual aesthetics. The aim of this site, aesthetically, is to create cognitive interest and support for exploring Mars in the future.

Text

When opening the site the image or the picture of Mars is desaturated of colour while the introductory text is introduced. The text message unfolds through printing one character at a time on the screen, leading the reader to follow the text (see Figure 5). One problem in terms of usability is that it takes time and the user might want to skip the text. That facility is not available and is probably not there for a reason.

Colour

Figure 5 – The text message unfolds through printing one character at a time on the screen, leading the reader to follow the text.

Although consistency in the effect of colour temperature on the message is commonly known (Zettl, 1999:57), not enough scientific evidence exists to prove the effect of cool and warm colours. The problem is that they never occur in isolation and usually operate within the context of other aesthetic variables.

When the text is complete, the overall colour of the image of Mars gradually changes to a warmer colour and higher saturation (see Figure 6). This increases aesthetic energy since colour saturation is the main attribute of colour energy, while colour energy is the relative aesthetic impact a colour has on us (Zettl, 1999:58). Hence, increasing colour saturation on the introductory image creates aesthetic energy that generates interest, enticing the user to go deeper. The change to highly saturated colours and the use of warm high-energy colours immediately intensifies the event and creates mood and excitement (Zettl, 1999:57,66,70). This aesthetic effect focuses the user's attention, creates interest and leads him to explore further. The general use of colour in this website supports the essential quality of the event (Zettl, 1999:66).
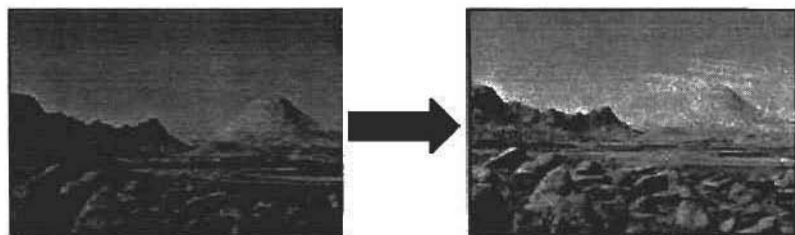

Figure 6 – The landscape gradually change to warmer colours and higher saturation.

In the context of the website, colour is used to add information to the message. It helps the user to distinguish between objects, and makes the scene more realistic (Zettl, 1999:70). As the user moves the mouse pointer over the image of Mars, embedded links appear.

These appear in two colours: red indicating a link to click on to explore further and yellow highlighted areas that are explained in accompanying text. The flashing marker beacons are used to add excitement and intensify the event (Zettl, 1999:67).

Predictive Effect of Visual Aesthetics

Gradually increasing colour saturation in the initial image, warm colours, high-key lighting (see Figure 6), the movement of the landscape on the screen from left to right (see Figure 7), the animation of a man walking in the direction of the habitat and the brief highlighting of embedded links on the image (see Figure 8) all have the effect of predicting excitement (Zettl, 1999:30), creating interest

Figure 7 – *Movement of the landscape on the screen from left to right.*

and leading the user to explore further. This is a classic example of conceptual blending. Each of these elements creates an input space; a generic space is formed and a new blended space is created that communicates predicting of excitement. This leads to the viewer's being curious about what is happening next.

The use of bright highly saturated colours helps to intensify and clarify the event (Zettl, 1999:68). It causes the users to look *at* the
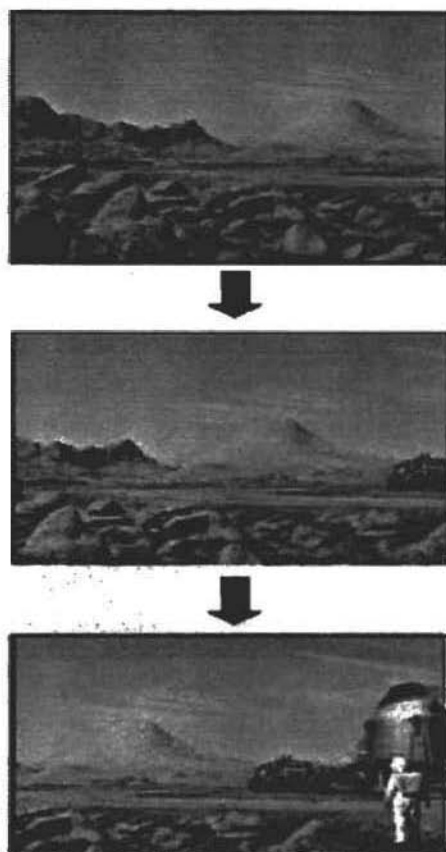
event rather than *into* (i.e., getting emotionally involved). Through applying (or rather not applying) the desaturation theory (Zettl, 1999:68), the site designers succeed in letting the user observe the event in detail rather than feel it or get involved emotionally. In this site, colour mostly has an informational purpose (Zettl, 1999:70).

The desaturation theory (Zettl, 1999:68) means that although bright, highly saturated colours are well suited to enhance an external high energy scene, they can prevent us from getting caught up and involved in a quiet intimate screen event. To reduce the outward effect of high-energy colours and emphasise the internal setting of an event, colours should be desaturated or omitted altogether. Viewers will then have to supply some of their own emotional energy in the communication process. Whether to use or not use high-energy colours depends on the overall communication intent.
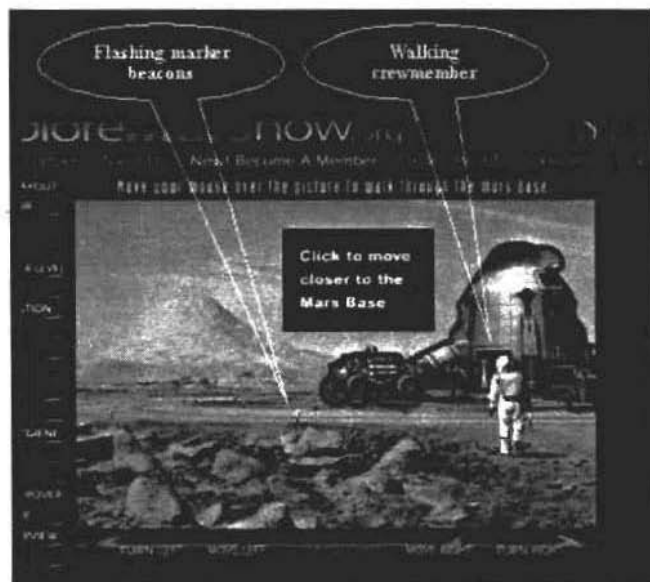

Figure 8 – Flashing marker beacons, animation of a walking crewmember and embedded links.

Lighting

Using a scene that has high-key lighting further emphasises the "up" feeling and excitement of the event (Zettl, 1999:28). The use of flat lighting and slow fall-off supports the theme of efficiency, cleanliness, mechanization and depersonalisation (Zettl, 1999:45). Flat lighting is used to provide optimal visibility (Zettl, 1999:44) and has been successfully applied in this website to support the theme and message, and create interest.

Horizontal Arrangement

The aim of this site is not to create an action-filled dynamic scene, but rather create a feeling of calmness, stability and normalcy. This is supported by using a horizontal arrangement of the initial view of Mars and the habitat (Zettl, 1999:89). This effect of stability is further supported by having a horizon that is not tilted, subconsciously supporting the reliability of the information and content (Zettl, 1999:91).

Judging Size

The image of the crewmember walking on the surface towards the habitat (see Figure 8) has two important functions: 1) it applies the aesthetic principle of using a human as a reference to help the viewer to judge size (Zettl, 1999:82), in this case the size of the habitat, and 2) it directs the eye to the most important image on the screen which is the habitat (Zettl, 1999:106), thus "showing" the user where to start to interact with the website. Another subtle function of the crewmember is to prompt the user to assume the role of crewmember when exploring further into the site.

Vectors

Directional forces or vectors that lead the eye from one point to another are probably the strongest forces within a screen (Zettl, 1999:106). A vector has directional certainty and power. In the initial image of Mars, vectors are successfully used to build screen space and event energy. A motion vector in the form of a crewmember walking in

the direction of the habitat entices the viewer to focus his/her attention on the habitat (see Figure 8). The line of marker beacons (see Figure 8) acts as an index vector explicitly pointing to the habitat not visible at that point in time (Zettl, 1999:106). Thus, together with the landscape moving from left to right, both vectors lead the eye and create curiosity about the event that they are pointing at.
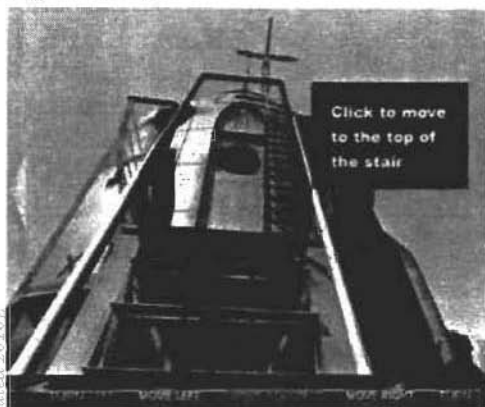
Aspect Ratio

Figure 9 – Assuming the role of crewmember.

A normal aspect ratio of 4:3 is used for the simulation of Mars. It makes aesthetic sense, because the difference between width and height is not so much to emphasise one dimension over the other (Zettl, 1999:75). Although it is a method applied better in larger screen (Zettl, 1999:83), a deductive approach is used where the simulation of Mars starts off with a wide established shot and then through embedded links focus is placed on close-up detail (Zettl, 1999:83).

Although on a smaller screen inductive shooting carries more aesthetic energy than a long shot (Zettl, 1999:85) it is not applied in this simulation of Mars because the pur-

Figure 10 – Enticing the user to participate in exploring Mars.

pose is not for the user to "feel" the event (getting emotionally involved) but rather to create interest and reveal the informational detail about the Mars base.

Although larger images carry more aesthetic energy (Zettl, 1999:83), a relatively small image is used in this website. It is most probably not applied in this site due to limited bandwidth and other technology considerations. Through the development of broadband Internet (e.g. Sentech), this virtual environment can be presented better using a large screen without sacrificing usability and page download time.

Psychological Closure

Viewers have a tendency to mentally fill in gaps in visual information. This is called psychological closure (Zettl, 1999:101,104). When viewers have to apply psychological closure it causes them to work with the event, getting them to participate, thus intensifying the event (Zettl, 1999:104). A low-definition event requires more mental effort making the user become more involved. These aesthetic principles have not been applied, simply because detail is important to communicate the intended message.

Magnetism of the Picture Frame

Users tend to pay more attention to an object that is placed on the right side of the screen rather than on the left of the screen (Zettl, 1999:98). Although controversy exists about this aesthetic principle it is definitely applied in the initial view of the habitat. The most important object or event on the screen is placed on the right side of the screen. In that way the designers made sure that it attracts the attention of the viewer.

Enticing the User to Participate in Exploring Mars

The possibility of the viewer's assuming the camera's viewpoint and position has prompted media people to use the camera subjectively (Zettl, 1999:192). Subjective camera, as it is referred to, tries to partici-

pate in the event rather than merely observe it. Throughout the website the user assumes the role of a crewmember and not just a viewer (see Figures 9 & 10).

Intensifying and Clarifying the Event

The overriding principle of visualisation is intensifying and clarifying an event (Zettl, 1999:183). In many scenes on this website various angles (points of view) have been used. This helps the viewer to see an object or event from various positions, thereby providing a more complete picture and intensified screen space.

Conclusion

This paper highlights visual aesthetics as an important contributor to online visual communication. It shows that visual aesthetics has the ability to get the user involved in the communication process. It discusses conceptual blending as a plausible explanation of how visual aesthetics works and how it contributes to human understanding. Principles of conceptual blending are furthermore used to identify and explain the impact of various elements of visual aesthetics that occur in a specific website. This research paper demonstrates the use of visual aesthetics for web pages by referring to examples and explaining their impact on human perceptions and ultimately communication intent.

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Author's Contact Details

Kirstin Krauss (kraussk@cput.ac.za)
Faculty of Business Informatics
Cape Peninsula University of Technology, Cape Town, South Africa