Research on Computer Image Processing Technology in Web Design Based on Visual Communication

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Abstract

Based on the visual communication, this paper introduces the characteristics of the web page and visual communication information. The content of webpage visual communication is designed from the point of view of web design computer image processing technology. From the color demand, color characteristics, harmonization rules, design principles and methods of enterprise websites, this paper focuses on how to apply the concept of visual communication to the design of web pages. From the simplicity, recognition and communication of the Internet analysis, we use the design, psychology, communication, aesthetics and other methods in the artistic factors. Besides, the web design program is given on the basis of analysizing the lake university website from the artistic and technical point.

Keywords: Visual communication, Web design, Image processing.

1. INTRODUCTION

The emergence of computer and network technology has changed the world and the way of human life. The emergence of the internet has led to the formation of the network economy, especially in the concept of e-commerce from the concept of practical process (Wang, 2014; Devi et al., 2015). The internet has played a decisive role. For people familiar with the network, the emergence of the page seems to be a long time ago, but it is seriously retrospective. In fact, the emergence of the page has a few decades time. In the whole process of development, the network technology is at an alarming rate of development and change.Web design is a new design field and network interdisciplinary(Ko et al., 2014). Which has inherited the traditional design concept part and it hasits own unique character. It covers not only the traditional visual communication design, but also includes information design, interactive design, and sensory design and so on.
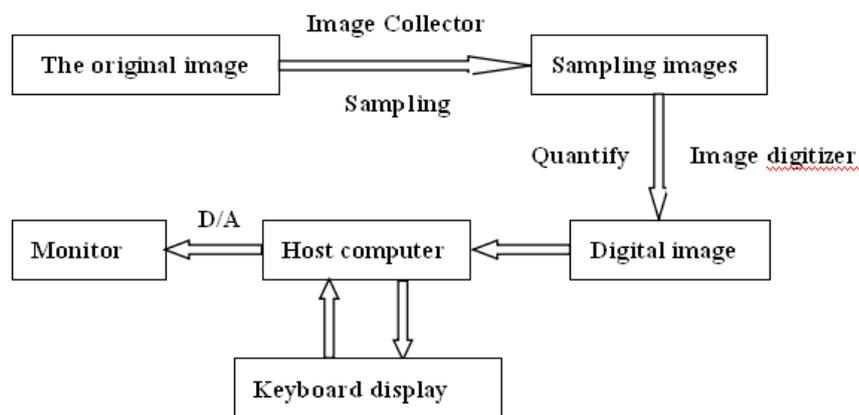

Figure 1. Digital image processing flow chart

Visual communication design refers to the use of visual symbols to convey a variety of information design (Zhang, 2014; Lee et al., 2014). The designer is the sender of the message and the object is the recipient of the information. Which referred to as the visual design. Visual communication contains the two basic concepts which are "visual symbols" and "communication". Based on the new media web design is a new design. It has a

strong visual effects, interactive, interoperability, wide audience and other media that do not have the characteristics. Firstly, a successful web design establishes a dynamic way of thinking. Secondly, it effectively introduces the art into the web design, which can increase people's interest in browsing the web. Digital image processing technology has wide range of applications. And digital image processing technology is developed rapidly (Srinivasarao and Chakrabarti, 2015). Image processing, the common processing of image digital, image coding, image enhancement, image restoration, image compression, image segmentation, image analysis, digital image processing flow chart are showed in figure 1.

2. VISUAL TRANSMISSION AND IMAGE PROCESSING

2.1 Web page and visual communication information characteristics

In the human senses, the impact of visual perception on people is the most important. In the visual system, people can get outside the information accounted from 70% to 80%. Visual communication itself is a way to convey the visual information. The visual symbols can be used to send and receive the external information. In the process of making the web, the main means of communication of information is through the visual generation (Huang, 2014; Venkata et al., 2015). And visual information is the key to the identification of web information. Before people are aware the behavior of a web page, they need to go through four processes: finding, discovering, selecting, and judging. When people need to perceive the information distributed in multiple environmental spaces, the phenomenon of beneficial visual choice will be generated. The principle is applied in the design of web pages. The need for a variety of visual information staggered together resulted that the identification of visual information can produce more obvious beneficial effects. In the demand analysis of web design, there are two main points: material function and mental function. At the same time only web page production can meet the above two aspects. In order to better fit the needs of users, it is necessary to pay attention to the user's visual information (as shown in Table 1). Which includes visual capacity, experience, association, aesthetic and many other factors (Liu Y L, 2014; Yuan et al., 2014). Based on this, the full account of the impact of human psychological factors are needed in the process of web design. Therefore, before the production of web pages, the first need is prepared to convey the corresponding data conversion, the formation of the corresponding visual information and then transfer the content to the user.

Table 1. The attention of visual communication in web visualization

Type	Text	SMS	Picture	Image
Attention	92%	84%	46%	22%

2.2 Web page visual communication design content

2.2.1 Text design

In the web design, the civilian is the subject of the transmission of information. The proportion is very large and it is the user that can quickly receive the most critical information on the page factors. In the text of the page production classification, it mainly divided into two types of functional orientation and reading instructions. The former is mainly used in the title, advertising and column name, etc.. Which is mainly used in the text of the article or the content of the subject and so on. For different application requirements, you can choose different types of text, so as to achieve the goal of web design. In the text design, we should follow the following several main principles: First, we should clear the role of the text in the page. The text is an effective carrier of information transmission and it does not misinterpret the function of the text as a decorative effect. In order to ensure the effective transmission of web information we need to convey the role of information. Second, the text in the page design and the page to convey the main content to fit, which do not appear from the subject and the conflict phenomenon. Finally, pay attention to the type of font not too much, generally not more than three. For the font style, to ensure unity, so as to reflect the aesthetic effect of the page.

2.2.2 Picture design

In the web production, there is often a misunderstanding that is only concerned about the visual impact of the page. But it ignored the role of information transmission. At the same time, too many dynamic images, which resulted that the user's visual confusion is also a very serious problem. In the design of the picture, we should

seek the goal of working balance between the artistic beauty and creative performance. The principle of applying the method is as follows. Firstly, we choose reasonable picture in webpage production. In the picture can be seen with the contents of the page and the right to contact and take into account the size of the picture to facilitate the loading of the page. The choice of pictures can ensure that the text can be a good fit, so that both produce are beauty. Finally, we use the rational dynamic images. The use of dynamic images can reflect the designer's creativity. Which makes the entire page picture simple, lightweight and reflect the visual charm of the page.

2.2.3 Color design

In the process of web design, we should reflect the basic principles of color applications and prevent the color of the complex or with the phenomenon of disorder. First, the use of web color takes full account of the aesthetic characteristics of the audience. The user's age and psychological needs to be analyzed carefully. Secondly, in the choice of color tone, in order to ensure that the web interface, the content of the page is consistent. Which do not appear unexpected feeling. Finally, in the application of color, in order to take full account of fashion, health, dynamic, lively and other factors, the different web needs.

2.2.4 Layout design

In the layout of the design, the visual fatigue phenomenon does not appear in order to take into account the human visual psychology. Through a reasonable layout of the visual process, we make the design of the page in line with people's visual habits. In the web design, we should follow some of the form of beauty in order to ensure symmetry and balance. Which changes the contract that has been to ensure the harmony of web production and make the content of the page to maximize the transmission to the user.

3. RESULTS AND DISCUSSION

Color in the web design also occupies a very important position. It is the main means of adjusting the viewer's visual psychology and attracting attention. As the web design is achieved through the computer, we must consider the computer color system functions. The three primary colors provided in the computer color system are red, green and blue. Through these three shades of color, we can create a variety of rich and interesting. However, it also can cause the visual excitement of the color to convey information and win the customer's purpose.

3.1 The color of web design

Let us see how to reconcile the color. The basic rule of reconciling colors is that the color of each part must constitute the appropriate color relationship. In order to form a unified tone a certain mood is expressed. This will have their own style. How can we do this? Establishing the color relationship of the main system. When the page has several patches, it must be one of the main color. Besides, its area, brightness and location are greater than other color blocks. Increasing the common point will make the design more coordinated. Pull away the distance, the purpose is to separate the primary and secondary, which do not pile up a pile. There may be methods: either from the plane or from the purity and brightness weakened. 1. Two-color deep and shallow. 2. At the same time we change the original lightness. 3. Purity contrast, so that one color bright and hazy. 4. While changing the original purity.The establishment of an expert system for computer image processing directly reflects the application of engineering in image processing. Figure 2 is the overall framework of such expert systems.
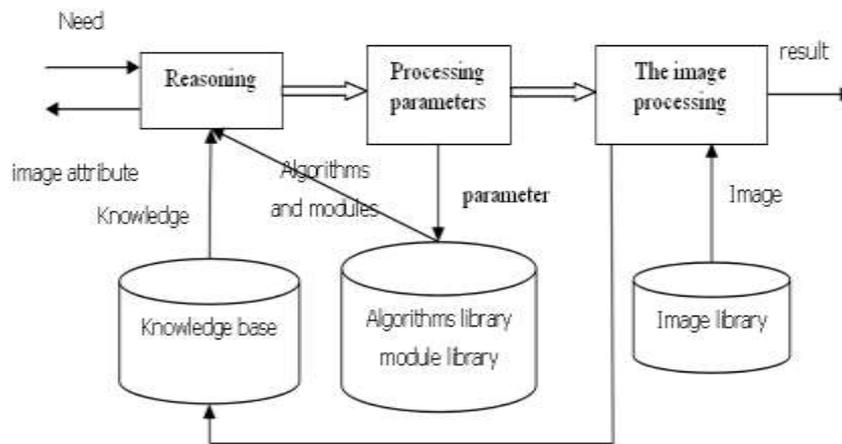
Figure 2. Overall frame map

The knowledge structure in the expert system must be convenient for the reasoning machine. On the basis of a certain knowledge analysis we can derive the appropriate image processing information. The establishment of a reasonably sound knowledge structure determines the role. The knowledge especially for the knowledge structure of the system can play an important role in image processing. (see Figure 3)
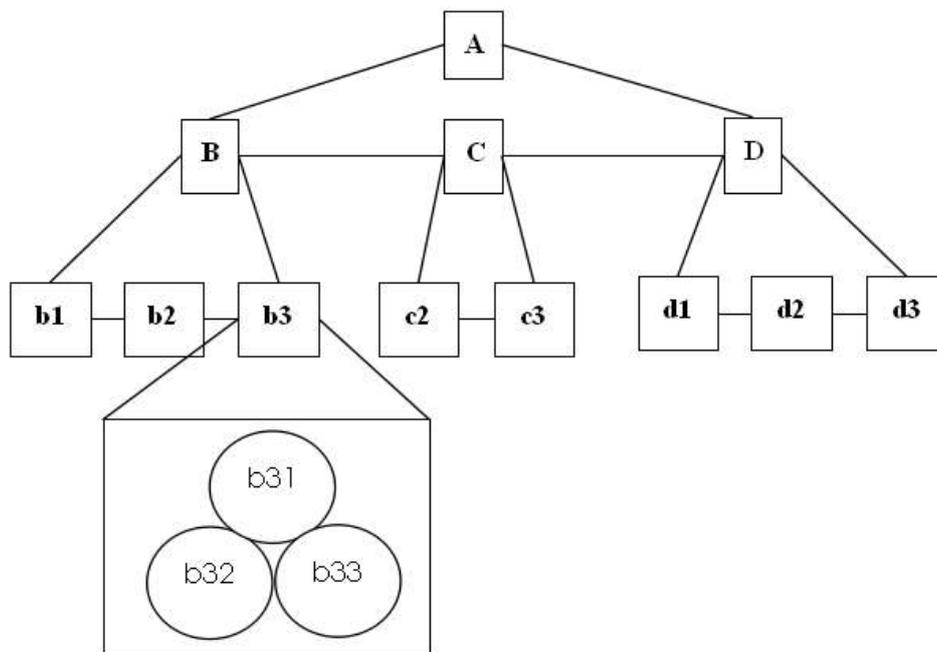
Figure 3. The knowledge structure of the system

3.2 Image processing analysis

It is undeniable that the current web design pass the main information. So the text in the page is still the largest and the text can avoid pictures. Sometimes the color of the transmission of information is unknown and lead to ambiguity, which is the best way to communicate intuitive. So that visitors can successfully and easily accept the information. There are two types of text on the page: one is the text with prompt and boot function, such as the title of the page, the name of the ad and the column. And the other is the longer reading material and descriptive text, such as the network, the text of the article and the detailed description of the theme. From the functional point of view, the former is to induce visual attention, while the latter emphasizes readability. Therefore, the design must be clear before the main function of the text, so that the purpose of communication is

effective to be achieved. In order to achieve the super-resolution reconstruction of the variable quality, it must meet the two conditions.One is the quality evaluation method with super-resolution reconstruction results and the other isthat the complexity of the quality evaluation algorithm should be much smaller than the super-resolution reconstruction complexity. If the second condition is not satisfied, the variable quality super-resolution reconstruction will lose meaning.In the same system architecture, different parameters can be used to achieve different image quality. As a result, based on the previous reconstruction of the parameters the results of the subsequent parameters can bring greater calculating amount.

For the execution of a processing, it must first turn to intermediate processing B, C, D. That must be carried out before the high-level processing.After the completion of a treatment, it will change the image of the property. These attributes can be the original image and they can also be the middle of the image.For some special layers in the structure, the processing on it must be divided. For example, the B process on the second layer in Fig. 4 must be executed strictly before the C process.The processing is based on the image of the property to determine the order of execution. For example, the third layer in Figure 4 is no strict implementation of the order. However, according to the image of the property knowledge, (2) and (3) also constrain this property knowledge. Therefore, it can be said that this knowledge structure is fragmented in the structure of the body.

In this paper, we use the OMP algorithm with different sparse degree constraints to reconstruct the image. The results are shown in figures 4, 5 and 6. And the quality evaluation method can be real-time. It is tested for the size of 481x321 engineer diagram, the quality evaluation time is 0.03 (s). Therefore, the quality evaluation method can be applied to the super-resolution reconstruction. Image quality evaluation meet the quality of variable super-resolution reconstruction conditions 1 and 2. On the basis of the visual attention and quality super-resolution reconstruction, this paper can greatly shorten the entire system of computing time. In the first application, the super-resolution reconstruction algorithm is used in this paper. In the practical application, super-resolution reconstruction of multiple visual significant areas can be carried out.
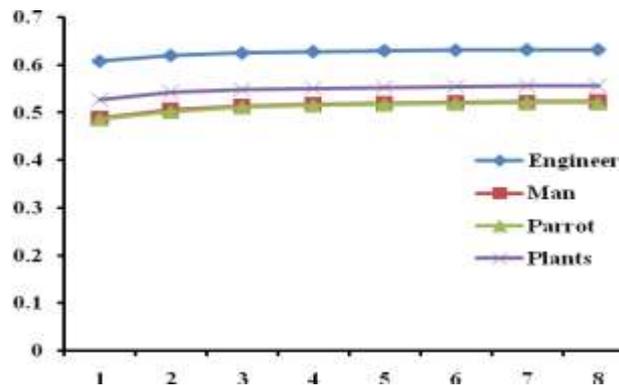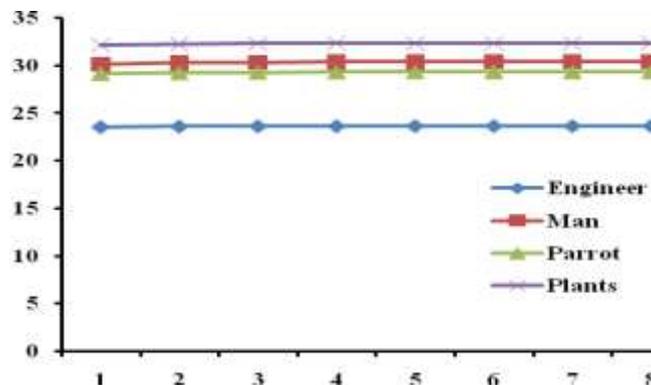

Figure 4. The value of Clear-F for different OMP

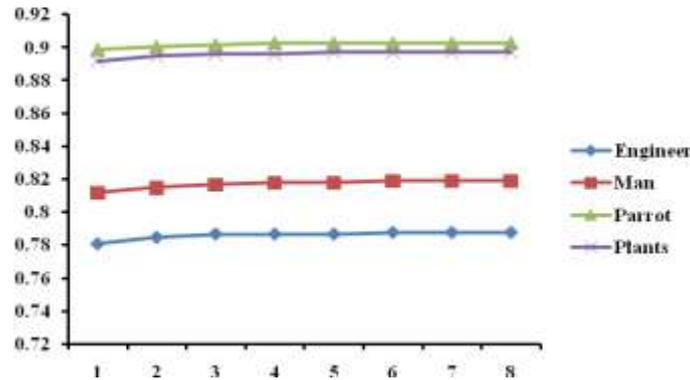**Figure 5.**The value of PSNR for different OMP

Figure 6. The value of SSIM for different OMP

4. CONCLUSIONS

This article is mainly from the web page, which started from the visual information communication. It stands the receiver's point of view and focuses on the study how to improve the efficiency of visual information transmission problem. The study of effective delivery of information involves the knowledge of many fields and disciplines. Not only the visual aesthetic aspects of the form, but it also needs to combine the psychological mechanism of the relevant content analysis. Of course, we should pay attention to the monochrome, adjacent color, contrasting color of the flexible application in the design process of the web. Meanwhile, we should aslo pay attention to the weight of the trade-offs, that do not make the viewer in the browsing process produce visual fatigue. At the same time the effect of the text design is bound to be part of the text to be simple, which is the first time to attract the attention of visitors.

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