A METHOD OF ADJUSTING THE COLOUR CONTRAST OF A VISUAL IMAGE

This invention relates to the presentation of the images for visual appreciation, more particularly but not exclusively to presentation of paintings for viewing.

The lighting and display of works of art, in particular paintings, is important if the qualities of the painting are to be appreciated.

The object of the invention is to provide a method and apparatus which can provide some flexibility in the way a visual image is presented.

According to the invention in the first aspect there is provided a method of adjusting the colour contrast of a visual image by bathing a selected region of the image with coloured light.

By selection of the colour of light in conjunction with the image it is possible to either enhance or reduce the colour contrast of the selected region of the image. In particular, by bathing the region in light of the same or similar colour to portions of the region, the intensity of that colour in the region is enhanced. Conversely, if the

contrasting colour is used, the intensity of the colour in the region is reduced.

Preferably, the coloured light may be provided either by at least one spot lamp with a suitable filter or by a projector having a colour slide or filter. The slide or filter may be a copy of said region with colours which either enhance or reduce intensity of portions of the region, depending upon the effect desired. Alternatively, the slide may include a plurality of portions of different colours corresponding to bands of generally the same colour within the visual image.

According to the invention in the second aspect, there is provided apparatus for adjusting the colour contrast of a visual image comprising means for bathing a selected region of the image with coloured light to enhance or reduce the intensity of a colour within the selected region.

According to the invention in the third aspect, there is provided a method of forming a colour filter for use in apparatus for adjusting the colour contrast of a visual image comprising forming a replica of said region, at least portions of said region being coloured so as to enhance or reduce the intensity of a colour within the selected region.

According to the invention in the fourth aspect, there is provided a method of forming a colour filter for apparatus for adjusting the colour contrast of a visual image comprising the steps of notionally dividing a region of the image up into at least two portions of generally the same colour and colouring corresponding portions of the filter with colours to reduce or enhance the intensity of colour of said portions.

The embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a schematic view of a conventional means of lighting a visual image;

Figure 2 demonstrates a first apparatus and method of adjusting the colour contrast of the visual image;

Figure 3 is a cross-sectional view of a spot lamp used in the embodiment of Figure 2;

Figure 4 illustrates a second embodiment of the invention in which Figure 4a is a schematic drawing of a painting;

Figure 4b illustrates primary and secondary colours and their relationship;

Figure 4c and Figure 4d show first and second filters usable to reduce and to enhance respectively the intensity of the colour of the picture of Figure 4a.

With reference to Figure 1, the conventional lighting scheme for a painting is shown in which the painting 10 is lit by natural light through windows 12 with a viewing region 14 being formed between the painting 10 and windows 12 from which observers 16 may view the painting 10.

It is a disadvantage of such an arrangement that the lighting may not be of a nature to bring out the best features of the painting 10. While brilliance of light is one factor which affects the visual impact of the painting, the inventor has found that the colour content of the light is also important.

In Figure 2, the first embodiment of the invention is illustrated in which the illumination for the painting 10, rather than being by natural or white light, is provided by a plurality of spot lamps 40, 42, 44, 46 each of which is provided with a colour filter to bathe the painting 10 with coloured light. In the example shown, for example, spot lamp 40 contains a blue filter with spot lamps 42, 44 and 46 having a purple or magenta filter. The lamps 40-46 may bathe the entire painting with coloured light or, alternatively, may focus on specific areas of the painting to adjust the colour contrast of that region only.

The colours of the spot lamps 40-46 are chosen in such a

way to adjust the colour contrast of regions of the painting 10.

The choice of which colour of light to use depends on the regions of colour of the painting 10 the colour of which it is desired to adjust. In general, bathing an area of the picture of one colour with the same colour will cause the intensity of that colour to be enhanced. Thus, to provide a bluer sky in a picture, the sky area of the picture could be bathed in blue light. In the alternative, if it is desired to reduce the colour contrast, the complementary colour is chosen. For the primary colours, the complementary colour is the secondary colour being the combination of the other two of the primaries. In this respect, the primary colours are those for the painting, ie. red, yellow and blue, rather than the primary light colours, red, green and blue. So, for example, the complementary colour to blue will be orange, being the combination of red and yellow. The complementary colour for each secondary colour is the primary colour from which the secondary is not formed, so red is a complementary colour of green since green is formed from yellow and blue. This is illustrated schematically in Figure 4b in which colour faces its complementary colour.

A schematic cross-sectional view of the spot lamps 40-46 is

shown in Figure 3. Each spot lamp comprises a lamp 50 having a reflector 52, lens array 54, 56, all contained within a housing 60. The housing 60 includes a slot for a filter 62 which includes a coloured region 64. The spot lamp also has a focusing lens 66 in a cylindrical housing 68 which is axially slidable relative to casing 60 to allow the beam 70 from the spot lamp to either bathe the painting 10 in diffuse light as shown or, alternatively, focus down to a well defined spot for illumination of only a portion of the painting 10.

The second embodiment of the invention is shown in Figure 4 in which a painting is schematically shown in Figure 4a. The painting shows a scene having a three distinct coloured areas, a sky area 80, of predominantly blue colour, a mountainous region of predominately red-brown colour 82 and a grassy region of predominately green colour 84.

In Figures 4c and 4d two slides are illustrated for use as coloured filters with a projector to be projected onto the painting. The filter has three distinct colour bands 80′, 82′ and 84′ and in Figure 4c these bands are chosen to be the complementary colours to the colours of the three general areas 80-84 of painting 78, so that region 80′ is orange, region 82′ is green and region 84′ is red. The effect of bathing the painting 78 in light from the filter

86 is thus to reduce the intensity of the colours of the painting.

With reference to Figure 4d, a filter 88 is shown which again includes three distinct bands of colour 80", 82" and 84". However, the colours of the three bands are chosen to be substantially the same as regions 80-84 that is to say blue for region 80", red for 82" and green for region 84" so that the effect of projecting light through filter 88 onto painting 78 is to enhance the intensity of colour of the painting.

As will be apparent to one skilled in the art, the colours of the bands of the filter may be chosen to provide different effects, for example, an effect of enhancing the intensity of colour of the mountain range 82 by providing a red colour in that band and reducing the colour of the sky by providing an orange colour in the band corresponding to the sky region 80.

In a further preferred form of the invention, the slide or filter is formed as a copy of the painting 78, at least as far as the detail of the painting is concerned. If the colours are the same, projecting the image exactly onto the picture will cause a dramatic enhancement of every colour in the painting 78. Similarly, if the complementary

colours are chosen, an attenuation of all the colours in the picture will occur.

Whilst the invention is being described with reference to bathing all or part of the picture in light of a single colour or plurality of colours using a projector or spot lamps, this is not to be construed as limited to any form of coloured lighting may be used. In some circumstances, for example, the use of the laser to enhance very specific areas of the painting, under computer control in the manner of visual display often found in discotheques or light shows may be used.

Furthermore, although the invention has been described with reference to adjusting the colour contrast of a painting, the invention is applicable for use with any visual image.

CLAIMS

1. A method of adjusting the colour contrast of a visual image by bathing a selected region of the image with coloured light.

2. A method is claimed in Claim 1 wherein the light is of a colour to enhance the intensity of a colour within the selected region.

3. A method as claimed in Claim 1 or Claim 2 wherein the light is of a colour to reduce the intensity of a colour within the selected region.

4. A method is claimed in any one of the preceding claims wherein the coloured light is provided by at least by one lamp.

5. A method is claimed in any one of Claims 1-3 wherein the coloured light is provided via a projector means having a coloured slide or filter.

6. A method is claimed in Claim 5 wherein the coloured slide is a copy of the detail of said region having colours the same or different from the visual image.

7. A method is claimed in Claim 5 wherein the coloured slide or filter includes a plurality of portions of different colours.

8. A method is claimed in Claim 7 wherein portions of the slide or filter correspond to portions of said region of generally different colour.

9. A method is claimed in any one of the preceding claims wherein the selected region is the whole picture.

10. Apparatus for adjusting the colour contrast of a visual image comprising at least one coloured light projection means arranged so as to bathe a visual image with light of a colour to enhance or reduce the intensity of colour within a selected region of the image.

11. A method of forming a colour filter for apparatus for adjusting the colour contrast of a visual image comprising the steps of notionally dividing a region of the image up into at least two portions of generally the same colour and colouring corresponding portions of the filter with colours to reduce or enhance the intensity of colour of said portions.

12. A colour slide or filter formed by the method of Claim 11.

13. A method of forming a colour filter for use in apparatus for adjusting the colour contrast of a visual image comprising forming a replica of said region, at least portions of said region being coloured so as to enhance or reduce the intensity of a colour within the selected region.