

Original Article: Color Conversion Filters



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ABSTRACT

One of the most important goals in the color photography process is to reconstruct and translate colors faithfully and correctly, and if the photographer wants the colors to have unnatural effects in the image, this unfaithful translation must be predictable and completely under the control and desire of the photographer. Special color photography filters are filters that serve these purposes. As mentioned, the process of translating and reconstructing colors depends on the topic of "color temperature".

It is emphasized again that the correct translation of colors in a color image is achieved when the color temperature of the light used is completely consistent with the color quality of the emulsion used. Different types of special color photography filters are actually color temperature filters that change the sum of the three colors of blue, red and green in the light or each of these three colors by different images.

Introduction

These filters are used when there is a very large difference between light and emulsion in terms of color temperature.

If the light used has a color temperature of about 3200 K and the emulsion used is daylight balanced for color temperature 5500 K to convert the color temperature of the light to the specific color temperature of the emulsion, blue color conversion filters of family 80 are used. This family has 4 filters, which are in order of concentration:

- 1.Filter A 80
- 2.Filter B 80
- 3.80C filter
- 4.80D filter

If the light used is of daylight type with color temperature of about 5500K and the emulsion used is of artificial type (emulsion type A and B which is balanced for color temperature of 3400K or 3200K) to convert the color temperature of light to color temperature Special emulsion family 85 color conversion filters are used. This family includes 3 filters, which are in order of concentration:

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- 1.Filter 85 B
- 2.Filter 85
- 3.Filter 85C

Color Correction Filters

These filters are used in a situation where there is not much difference between the color temperature of the light and the emulsion. Sometimes the photographer selects an emulsion close to the type of light available, for example, when working in daylight, he uses type D emulsion, and when working in tungsten light, he uses type A and B emulsions, but although the choice of the emulsion is done correctly and as a result the very large difference between the color temperature of the light and the emulsion is eliminated, there may still be a slight difference between the two, i.e., light color temperature and emulsion [1-4].

However, for full compliance of these two bases, i.e. light color temperature and suitable color temperature for emulsion, color temperature correction filters of 82 and 81 families are used [5-7].

In this case, there are two possibilities:

A) If the color temperature of the light is higher than the specific color temperature of the emulsion, the orange family 81 is used. This family includes 6 filters, which are in order of concentration:

- 1.Filter 81EF
- 2.Filter 81D
- 3.Filter 81C
- 4.Filter 81B
- 5.Filter 81A
- 6.Filter 81

Color Compensation Filters

Color correction filters change the total light (total light - green, blue, and red) to orange or blue as mentioned. In fact, a change in color temperature means a simultaneous and uniform change in all three light-colors in the desired light [8-10].

For example, although in light with a color temperature of 4000K there is no perfect balance between the three lights - red, green and blue, when we put each of the types of color

temperature conversion filters in front of this light, all three lights - color at the same time are strengthened or weakened. Sometimes we encounter light situations in which the amount of one of the three lights - primary color (red, green, blue) or three lights - secondary color (magenta, cyan, yellow) is more than usual or less. It is more than expected.

Therefore, color compensation filters are used to weaken or enhance each of these colors alone and without affecting other colors. Color compensation filters, abbreviated as CC, are made in 6 colors, each color has seven filters with seven different concentrations [11-14].

These 6 series of color compensation filters can also be used together in combination, which will have combined effects: Among the most important cases of application and use of these filters are as follows:

- These filters are used to correct and compensate the color during color printing in printing machines and aggregators. Light sources that are spectrally disturbed (such as fluorescents) and produce excess color on the image can be corrected by these filters, allowing colors to be translated and reconstructed when working with these light sources.
- To compensate for the color and remove undesirable colors from old emulsions; images produced on old emulsions are usually exposed to excess color or weakness in some colors, which are compensated and removed by using these filters on the camera lens.
- In some scenes, there may be a certain additional pigment, for example, in the forest, due to the reflection of green light from the chlorophyll of plants, an extra green pigment is always seen in the scene, which can be removed with these filters.

Color perception and types of color contrast

Although we all have our own unique experiences with color, we often react to color on three distinct levels.

The first level is aesthetic. The main question is what visual effects will the color combinations have on the viewer? At this level,

the combination of colors is visually desirable. Our reaction at this level is shaped by our individual tastes.

The second level is emotional and refers to the effect of colors on emotion. The function of evoking our senses and creating a special mental feeling occurs when we see a color at this level. Our reaction at this level is instinctive and unconscious.

The third level is psychological. At this level, semiotic interactions are expressed with the expression of colors, and it deals with the question of what colors symbolize or represent.

When we see a combination of colors, our brain makes a kind of perception of visual experience by going through these three levels. In fact, the brain begins to function at these three levels of visual experience to receive a kind of mental effect. For example, when painting a morning scene, the painter is faced with the question of what color combination to paint the morning light so that the viewer, seeing it unconsciously, says: Oh, what a beautiful morning! Here the painter thinks to himself how to achieve this perception and effect. Does it make the morning yellow and orange or blue and purple?

The quality of the morning scene will be different in each case. In this example, of course, the morning light must not only look natural, but must intensify the symbolic and emotional nature of the scene. Like all painters and visual artists, photographers need to mix and match colors (colored lights in combination with the color in the scene) to create the right background for the formation of effective images.

The eye and the brain perceive color through constant comparison and contrast. We experience color through its relationship to other colors. Our eyes tend to contrast.

Therefore, to create this tendency in the scene, we need contrast so that the eye can do this comparison. There are many types of color contrast. The simplest color contrast is warm to cold contrast. Consider red and blue as two extremes of hot-cold contrast [61]. We can assign a color value to the colors that indicates

the amount of red or blue in the desired color. This contrast represents the same relationship that exists in nature between direct sunlight (Sky Light) and sky light (Sky Light). The second form of color contrast is a Saturation Contrast.

That is, colors can be placed next to each other with varying degrees of saturation and create a contrast that the eye can focus on and accept a better and more complete effect of colors. The third figure is the contrast of the main colors, which is obtained by combining the three main colors red, green and blue. The fourth figure is the contrast of secondary colors, which is obtained by combining the colors yellow, magenta, and cyan. And the fifth type of contrast is the contrast of complementary colors. Complementary colors create the most dynamic contrasts when combined.

On the other hand, the combination of these complementary colors causes contrast.

The sixth color contrast is Simultaneous Contrast. The eye mentally and subconsciously perceives any complementary color by seeing any color in its vicinity, especially in dark areas of the scene. Simultaneous contrast theory states that the effect of a color changes to its complementary color. Red light always causes us to see shades of green-blue [6].

White

White lies at the heart of all spectrums and is integrated. White represents the emotions, genius and potential talents of the individual and is a color that enhances individual genius and abilities and is considered suitable for all color mechanisms. In the shadow of this color, the person feels psychologically purer and can save himself from pollution [3].

Black

The color black, as its negator, indicates a departure from interest, surrender, or eventual renunciation, and has a strong effect. Black represents the absolute boundary beyond which life stops and therefore represents emptiness and destruction. Black means no and the opposite point yes means white, white remains an empty scene on which the story should be written, but black is the end beyond

which there is nothing. Black and white are the two limits of extremism and excess and have the verdict of beginning and end.

Gray

Gray is neutral, neither mental, nor objective, nor internal, nor external. It is neither anxious nor sedative.

Gray has no boundaries and territory and is only a border, a border like "nobody's land". Gray has the special attribute of not participating or not doing anything to others. It also has an obvious element of secrecy.

Freddy, who is gray in color, can be inferred that he wants to build a wall around everything and make himself uncommitted and inactive so that he can protect himself from any external influence or stimulus.

This person does not tend to participate in work and through his actions refuses to participate in work in front of someone who rejects the color gray. He has an adventurous spirit and is committed to motivating and anxious actions. This person wants to remove any obstacle in the way of his goal and is not

calm and calm to reach his goal. As a result, gray has a passive effect on mood.

Blue

Blue has a calming effect on the central nervous system. It lowers blood pressure, pulse and respiration and is suffocating. Psychologically, the tendency to be sensitive and easy to get upset increases with the choice of this color. The color blue represents unity and a sense of belonging, as well as a soothing sensitivity and an expression of the depth of feeling.

Jung writes about blue: "In our imagination, blue means depth and height, blue sky above the earth and the blue sea and beyond. In religious paintings, virgin maidens' shirts are painted in sky blue. "The world has a feminine nature, but the concept of the depth and height of this feminine world is in blue, which has a masculine nature." Unlike blue, yellow and red do not have depth.

The use of blue along with warm colors increases the artistic-intellectual feelings of the person. Dark blue evokes memories of the past as well as dreams in humans.

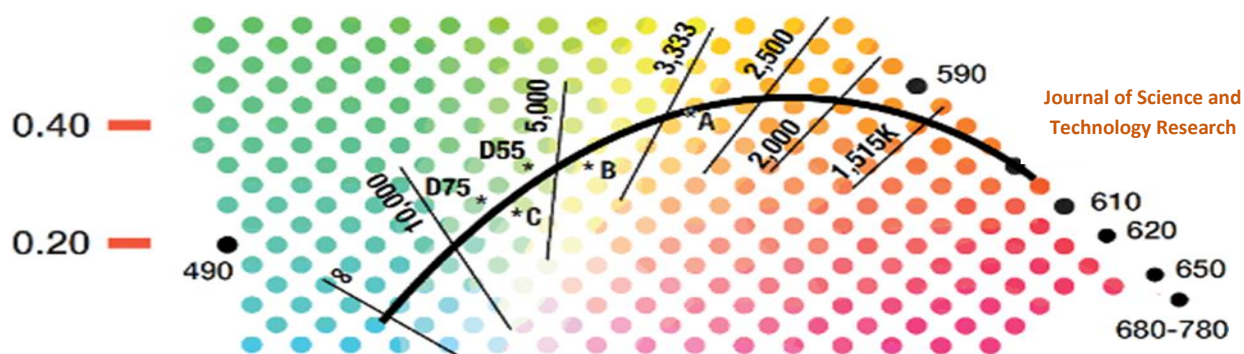


Figure 1. Defining the Temperature and Color Deviation of Lighting

Green

Green has a calming effect and is considered as a symbol of compassion, kindness and balance of soul and spirit. This color of compassion, kindness, friendliness and friendship increases in human beings. If more communities tend to this color, it will have better peace and stability.

This color also indicates the will to do the work, the work behind and endurance. Bluish green indicates determination, stability and,

most importantly, resistance to change. He finds his intellectual values and he also wants to put his ideas in a chair and introduce himself as a representative of the basic and unchangeable principles. On the one hand, this factor increases a person's sense of pride and superiority over another, and on the other hand, it causes anxiety and apprehension about losing the position [4].

Yellow

Yellow increases blood pressure and speeds up the pulse and respiration. Yellow is opposite to green. This means that in the face of the anxious state of green, yellow indicates relief and expansion of mind.

The glow of yellow turns human emotions upside down and frees man from sorrow. Activating this force is like releasing a huge amount of latent energy inside a person. "The warming and therapeutic effect of yellow can be felt," says Goethe. The warmth that this color creates has a tremendous effect on vitality and mobility. When you look at a scene from behind a yellow glass - especially on a gray winter day - your eyes sparkle with joy and your heart rejoices. You get excited and feel the warmth inside you. Dealing with yellow helps us to understand the unknowns and disorders of our being. Vincent Van Gogh is one of the painters who had symptoms of schizophrenia. He subconsciously tried to heal himself by using more yellow in his paintings.

Red

Red speeds up the pulse, raises blood pressure and increases respiration. Red represents vital force, nervous activity, and means desire, and has all forms of desire. Red means the need to achieve the desired results and achieve success and indicates a strong desire for all things that have the intensity of life and perfection of experience in their cover.

Red means the stimulus, the will to win, and all forms of passion for life and power, from sexuality to revolutionary developments, are motivations for intense activity, sports, provocation, competition, and sexual desire, as well as the effect of the will. The person who chooses red wants to live a full and vibrant life through his activities, and the rejection of red may be due to suffering from a lack of passion for life. When red is rejected, sexual desire either disappears to a large extent and is severely suppressed, or sexual weakness or a cold temper prevails.

Pink

Pink is the safest and most appropriate color that can strengthen the feelings of kindness, compassion, support, monotony, openness, love, trust and faith in what is needed. Due to its special power, pink color affects the thymus gland and makes a person have a forgiving and emotional spirit. The presence of this color is also useful in associating meanings and memories. In short, pink removes turbidity, nervousness, anger and calms behavior.

Brown

The brown color is a combination of yellow and dark red. The salty nature of life is reduced by the darkness in this color. The brown color loses the vast creative motivation due to the active force of red [14-16].

Homeless people who have no place to rest and have the slightest hope of security and physical well-being in the future often choose brown. This was especially the case among the homeless and displaced in World War II. Therefore, coffee indicates the importance of home and family and social and family security. Coffee indicates an increasing need for physical comfort and sensory satisfaction in order to get rid of a situation that causes a feeling of discomfort.

This may be a form of insecurity and a real physical illness, or it may be a conflicting environment or problems that one is unable to deal with. The multiplicity of colors in nature or in its artificial form with different colors and values is so much that there is no room to study all of them at this time, and only the examples mentioned here are the colors that are most common to everyone.

Conclusion

Colors have a place both in our inner world and in our outer world. We have both objective and subjective perceptions of them.

"Although objective vision is related to the human psyche, man feels happy to see colors through mental perception," Gerhard Ott wrote in an introduction to Goethe.

Because our perceptions are in harmony with colors, by comparing the relationship between man and color, we come to the conclusion that color miraculously reflects human states, emotions, and physical condition and influences us. Colors are so closely related to all the factors and details of our lives that it must be said that colors are like steps that connect the physical and spiritual existence of human beings with other details and phenomena of the universe. This connection and effect is so great that even human beings use colors in their words and sentences to express their inner feelings and express it.

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