

Activity 6 - Enhancement of Color Images

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White Balancing Faded Photographs



original



contrast stretching



grayworld



white patch

Contrast stretching produced the best image among the three. Gray world has a bluish tint with yellow patches over some white areas. The white patch algorithm does a bit better than the gray world, but there is still a little brownish tint left. The white patch I used is the white background of the red cross.

White Balancing Faded Photographs



original



gray world



white patch



contrast stretching

There is very little difference after contrast stretching the original image. The gray world and white patch algorithms did a much better job. The white patch algorithm produced a brighter image than gray world algorithm, but is a bit "foggy." The white patch I used is the white wall at the back.

White Balancing Photographs with Unbalanced Colors



original



contrast stretching



gray world

Contrast stretching barely helped in enhancing the colors of the image. The gray world algorithm, on the other hand, was able to remove the bluish tint from the original image. However, the colors become distorted for areas in the picture that are very bright, such as their hair.

White Balancing Photographs with Unbalanced Colors



original



gray world



white patch



contrast stretching

There is very little difference after contrast stretching the original image. The gray world and white patch algorithms did a much better job. Although, the white paper has a yellowish tint in the gray world algorithm. The white patch algorithm also did well, but there is still a slight bluish tint left. The white patch I used is the white paper.

Additional Steps to White Balancing

I added an extra step to the gray world and white patch algorithms in the original instructions. After dividing by the channel mean, I multiplied the resulting values by the overall mean of the image or the white patch.

reference: <https://www.codeproject.com/Articles/653355/Color-Constancy-Gray-World-Algorithm>

Conclusions

I tried the algorithms on several other photographs. The white patch algorithm generally does the best job of enhancing the image color. Unfortunately, contrast stretching doesn't work most of the time. In the event that there are no white patches in the image, gray world generally does a better job than contrast stretching.