
Medical Application of Digitized Movies and the Status of Their Color Management

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Abstract:

The subjects discussed in this paper are (1) the history of movies used in medicine, (2) the relationship between the characteristics of the human visual sense and the performance of color reproduction, and (3) the present state of color management of movies from the standpoint of both video and computers.

1. Introduction

First I would like to introduce the history of movies used in medicine. Starting from analog black & white films, the medical usage of movies improved along with changes in movie media. Media improvement moved from B&W film, color movie film, analog video media to digital video media. In particular, the change to digital media induced movie manipulation using computers. Now it is possible to process numerical and character data, pictures and movies using the same multimedia method.

Introduction of computer movie processing brought about marvelous changes in medical movie usage. Also I will discuss how color management changed depending on the media transition.

2. Relationship between the characteristics of the human visual sense and the performance of color reproduction

I would like to discuss how physical reproduction differs from the human visual color sense. Variations in human color sensation are a great many. For example, if you see the same object using the right and the left eye separately, the color of the object differs. But if you see the same object using both eyes, you cannot sense any difference in color at all. The eye itself as color sensor and the data processing of the brain revise the color sensation.

The mechanism of dyschromatopsia will be presented and a discussion about color presentation problems will be introduced. Is it possible to make presentation slides which both those with normal color sensation and those with dyschromatopsia can recognize well? Imperfect color management can possibly cause color sensation problems especially for dyschromatopsia people.

3. Color management of movies

From the standpoint of both video and computers, I will discuss color management of movies. How to manage color under variations of the video playback environment will be discussed. And finally computer color management will be introduced.