Exercises on MMDB
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Exercise 2

Topic: Color Models

Aufgabe 1: Color Perception

1. Given Figure 1, roughly plot the Spectral Power Distribution for the following light sources: Daylight, incandescent bulb, mercury fluorescent bulb.

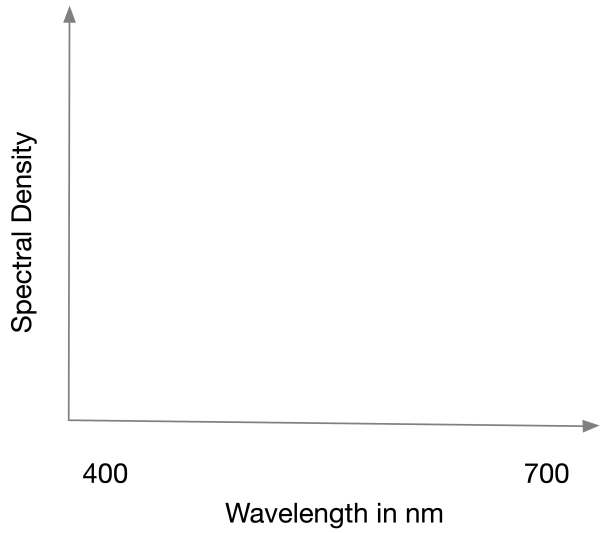

Abbildung 1: Spectral Power Distribution

2. Plot a graph of the spectral sensitivities of the S, M and L cones in the human eye. For each cone mark the wavelength of maximum absorption.
3. What are Metamers?
4. A piece of paper when viewed under daylight or indoors under an incandescent bulb appears to be white in both cases, even though the irradiance differs (white light vs yellower light). Explain this phenomena.

Aufgabe 2: Color Models

1. What is a color model?
2. Describe the main properties of the following color models: RGB, CMYK, HSV.
3. Can every color perceptible to the human eye be displayed as a combination of three primaries? Give evidence to support your answer.
4. Given a colour represented in RGB colour space as R= 0.2,G= 0.6,B= 0.3, what is its representation in the CMYK and HSV colour models?

Aufgabe 3: Color Spaces

Watch the following video on YouTube with Google Chrome:

`https://www.youtube.com/watch?v=sWEGXP-Ca9o`

During watching, reduce the resolution to 240p. Obviously, the video isn't as sharp as before. In addition, the colors look a little different.

1. What is the rationale behind the color difference?
2. How does the CIE Lab color space differ from CIE XYZ?