

ECE 63700 Laboratory:

Introduction to Colorimetry

Shang Hsuan (Sean) Lee

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1 Introduction

No reports needed.

2 Plotting Color Matching Functions and Illuminants

2.1 Plot of the $x_0(\lambda)$, $y_0(\lambda)$, and $z_0(\lambda)$ Color Matching Functions

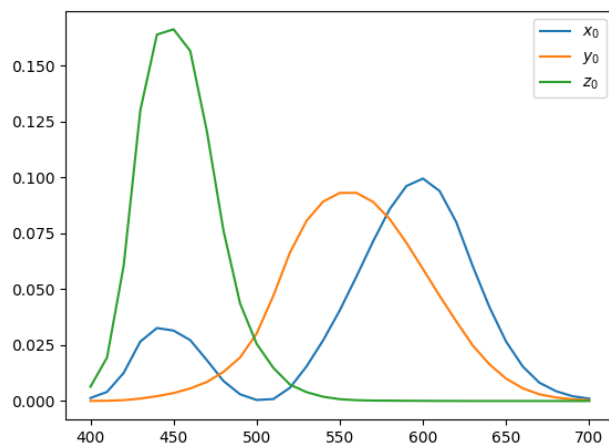


Figure 1: Color Matching Functions v.s. Wavelength

2.2 Plot of the $l_0(\lambda)$, $m_0(\lambda)$, and $s_0(\lambda)$ Color Matching Functions

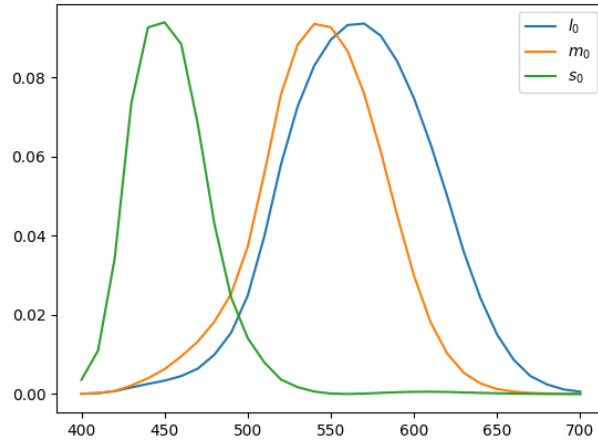


Figure 2: Color Matching Functions v.s. Wavelength

2.3 Plot of the D_{65} and Fluorescent Illuminants

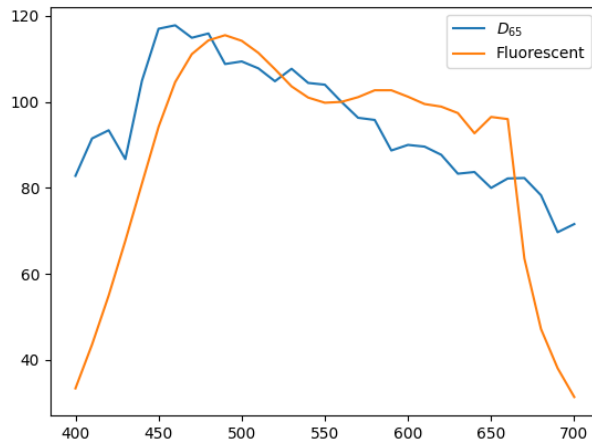


Figure 3: Spectrum of the D_{65} and Fluorescent Illuminants v.s. Wavelength

3 Chromaticity Diagrams

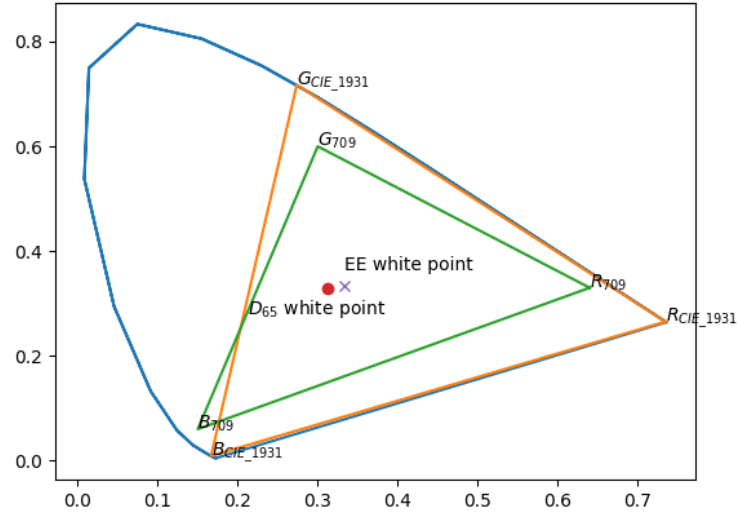


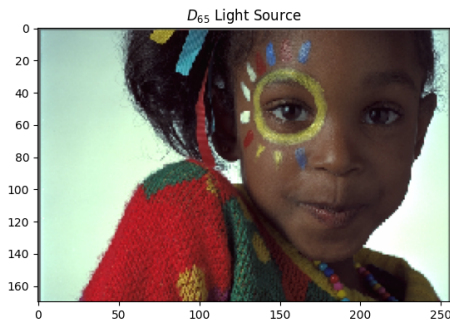
Figure 4: Chromaticity Diagram

4 Rendering an Image from Illuminant, Reflectance, and Color Matching Functions

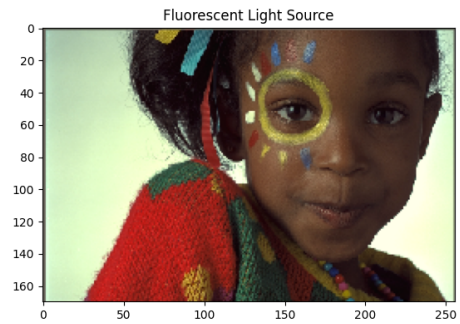
4.1 The matrix M_{709_D65}

$$M_{709_D65} = \begin{bmatrix} 0.4124 & 0.3576 & 0.1805 \\ 0.2126 & 0.7152 & 0.0722 \\ 0.0193 & 0.1192 & 0.9505 \end{bmatrix}$$

4.2 Images Obtained from D65 and Fluorescent Light Sources



(a) D_{65} Light Source



(b) Fluorescent Light Source

4.3 Qualitative Description of the Differences Between the Two Images

It is clear that the image rendered with Fluorescent light source is brighter than the image rendered with D_{65} light source.

5 Color Chromaticity Diagram

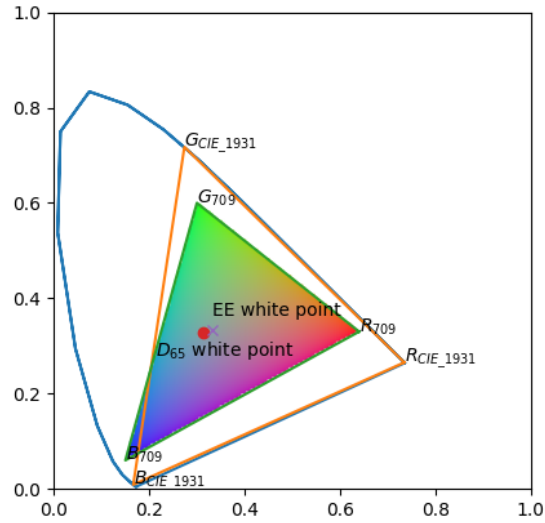


Figure 6: Color Chromaticity Diagram