Digital Signal Processing I
Purdue University
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Lab 2 Report

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1 Plotting Color Matching Functions and Illuminants

1. The plot of the $x_0(\lambda)$, $y_0(\lambda)$, and $z_0(\lambda)$ color matching functions.

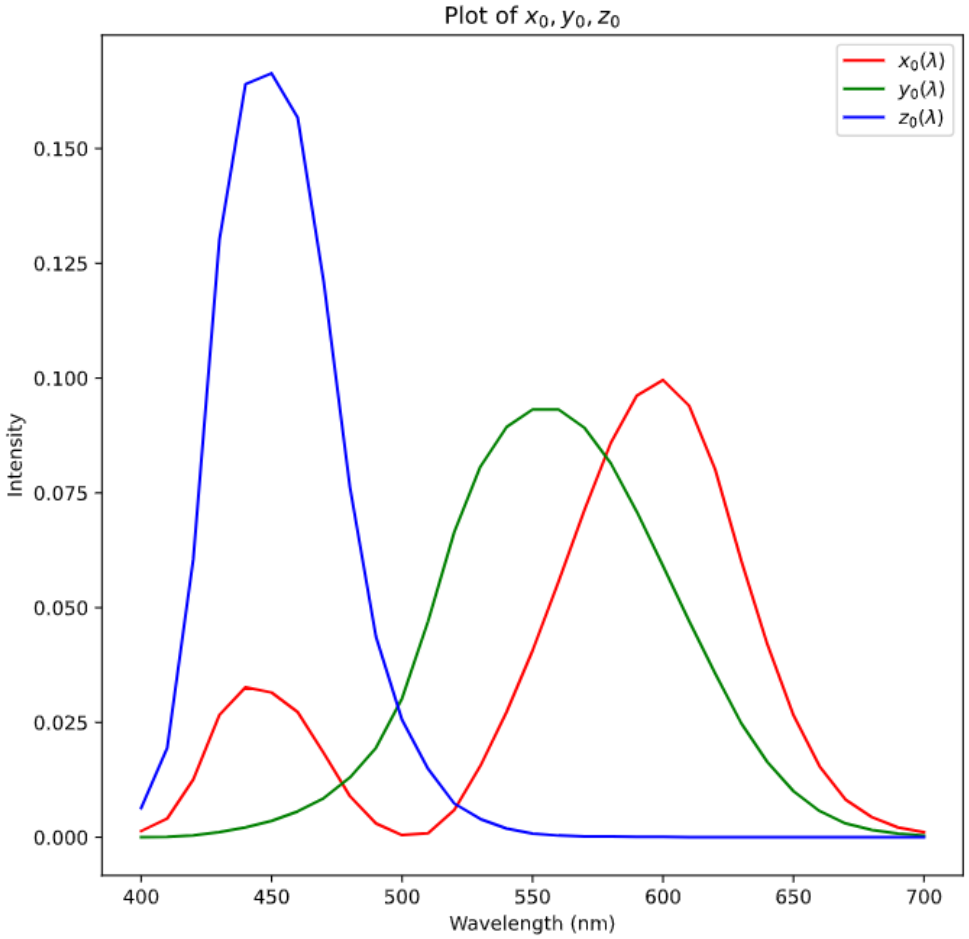

Figure 1: Plot of x_0, y_0, z_0

2. The plot of the $l_0(\lambda)$, $m_0(\lambda)$, and $n_0(\lambda)$ color matching functions.

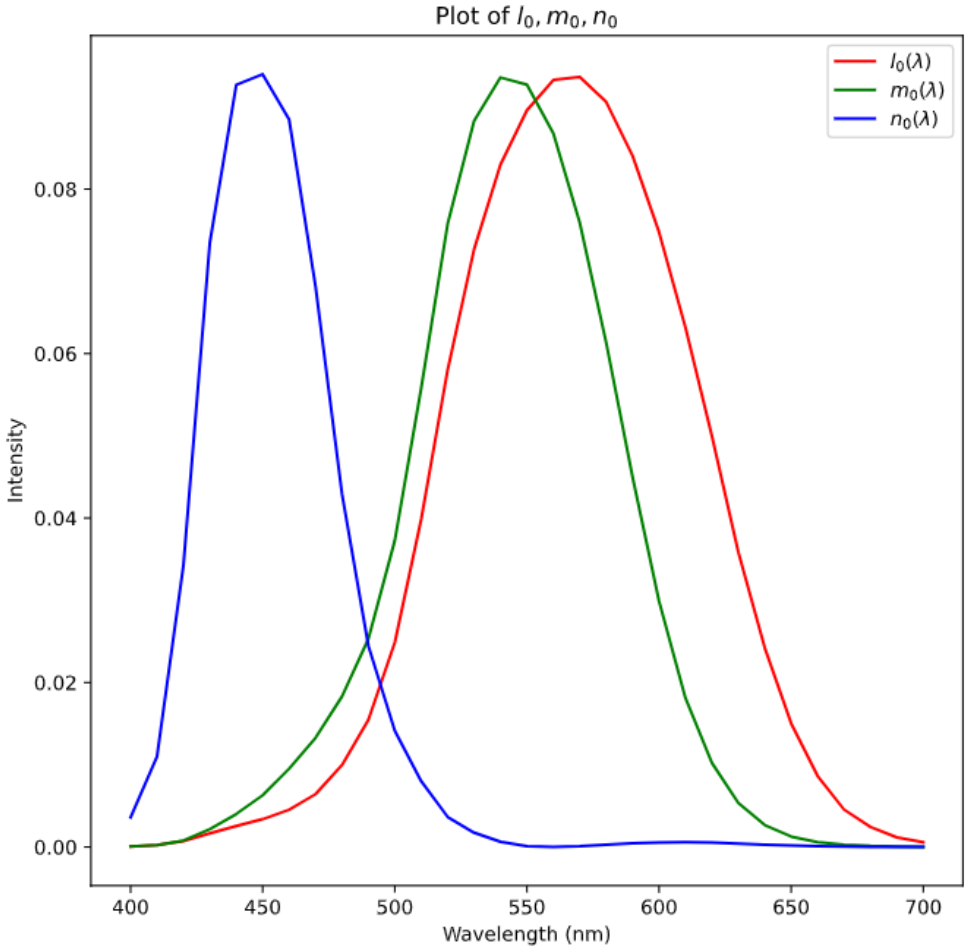

Figure 2: Plot of l_0, m_0, n_0

3. The plot of the D_{65} and fluorescent illuminants.

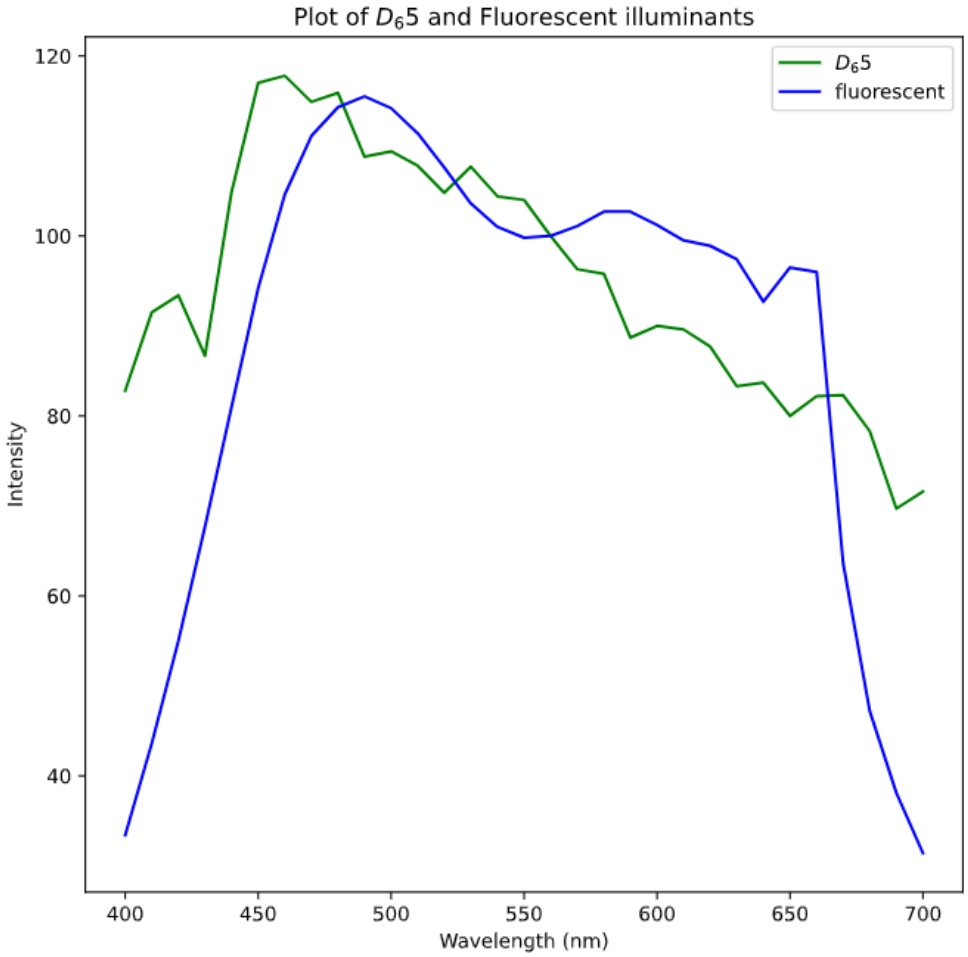

Figure 3: Plot of $D_6$5 and Fluorescent illuminants

2 Chromaticity Diagrams

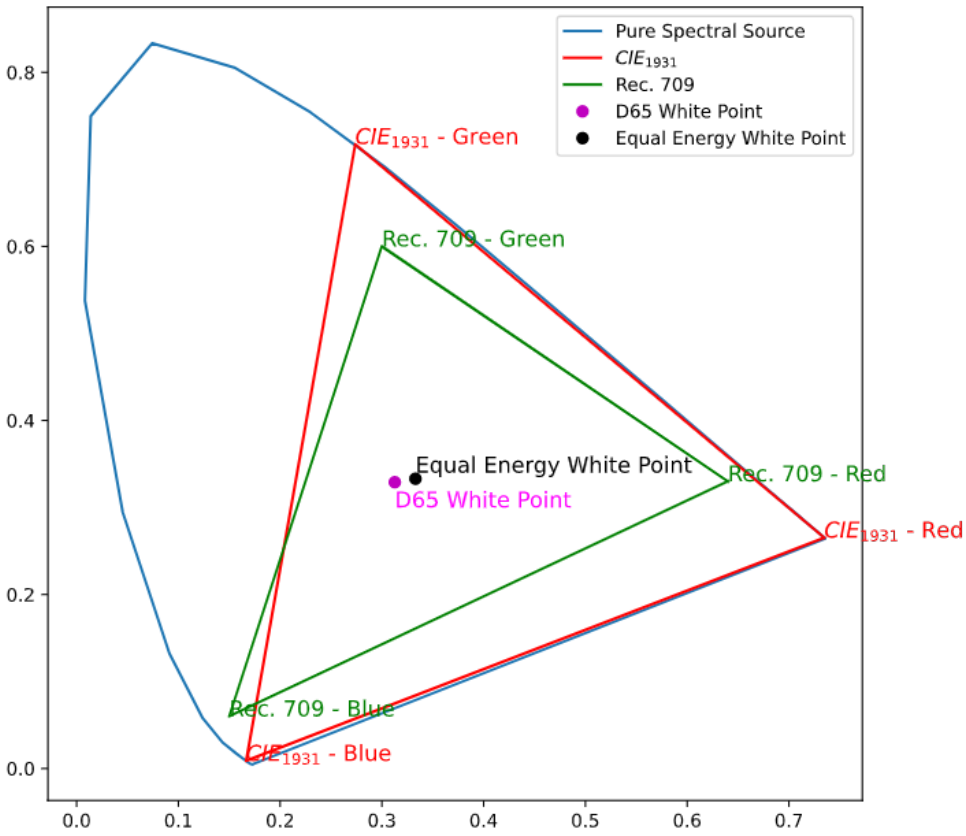

Figure 4: Chromaticity Diagram

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

1. The matrix M_{709_D65}.

$$M_{709_D65} = \begin{bmatrix} 3.24096994 & -1.53738318 & -0.49861076 \\ -0.96924364 & 1.8759675 & 0.04155506 \\ 0.05563008 & -0.20397696 & 1.05697151 \end{bmatrix}$$

2. The two images obtaind from D_{65} and fluorescent light sources

Figure 5: Image obtained from D_{65} light source

Figure 6: Image obtained from fluorescent light source

3. Comparison between the two images

   The most noticeable difference between the two images is the background. The tone of the D_{65} image is colder than the image with fluorescent light source.

4 Color Chromaticity Diagram

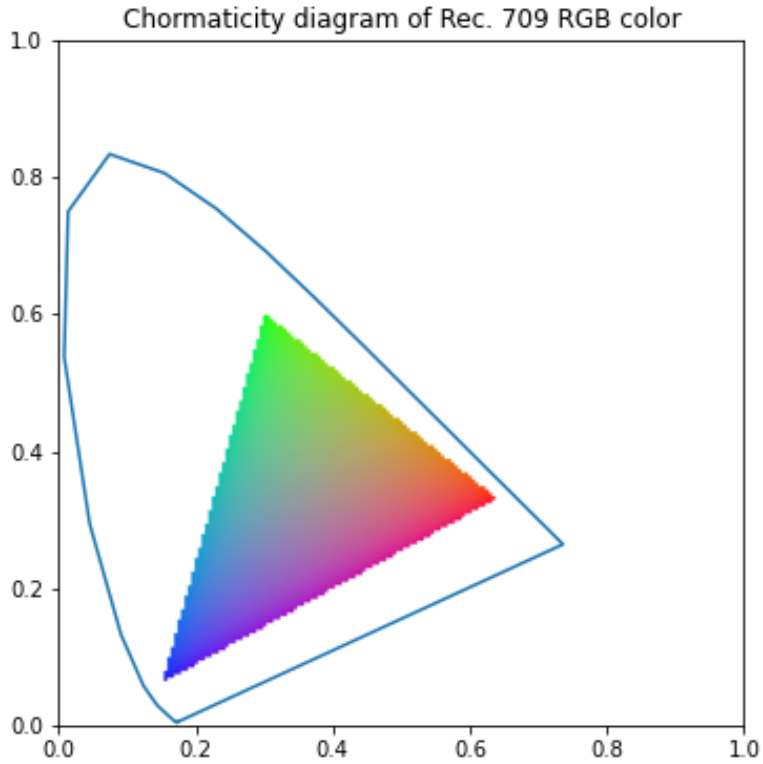

Figure 7: Chromaticity Diagram of Rec. 709 RGB color