Digital Image Processing Laboratory 6

Introduction to Colorimetry

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100/100

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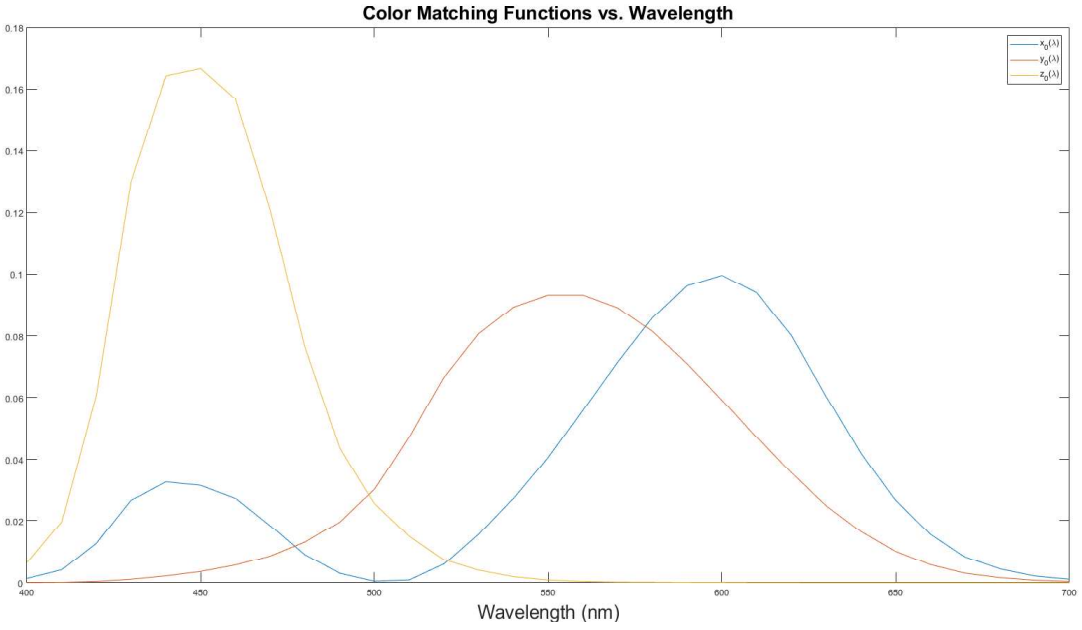
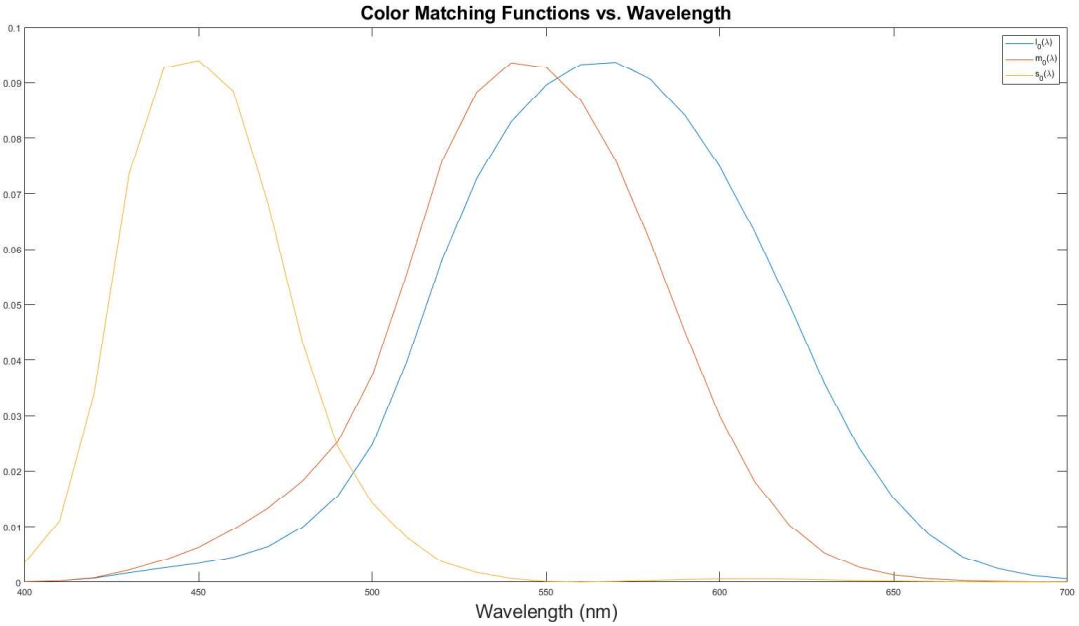
1 Plotting Color Matching Functions and Illuminants

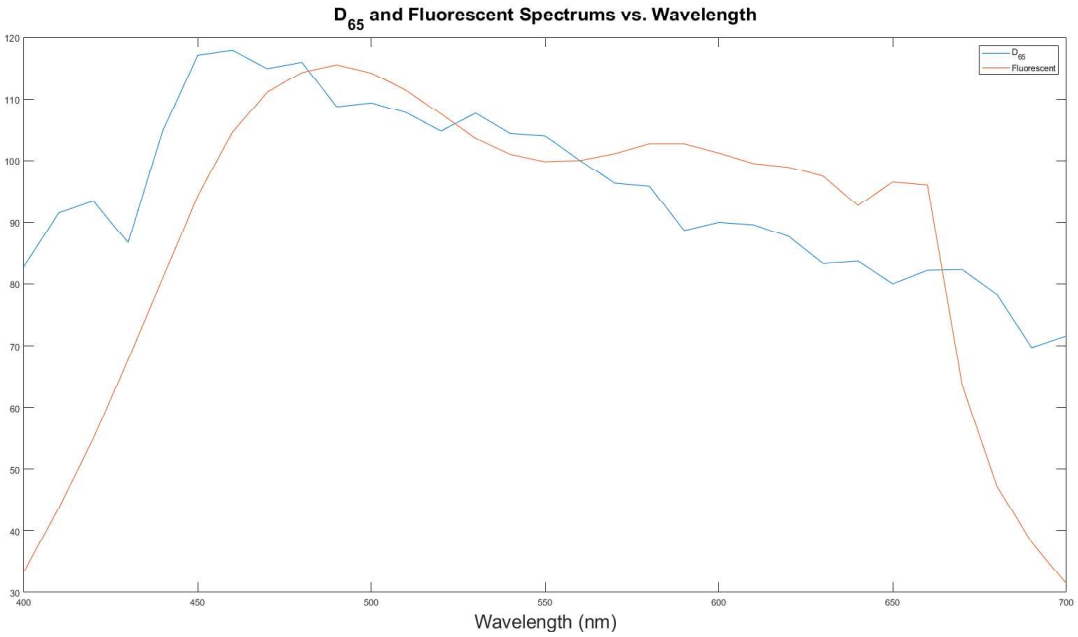
1.1 Plot of $x_0(\lambda), y_0(\lambda), z_0(\lambda)$ color matching functions



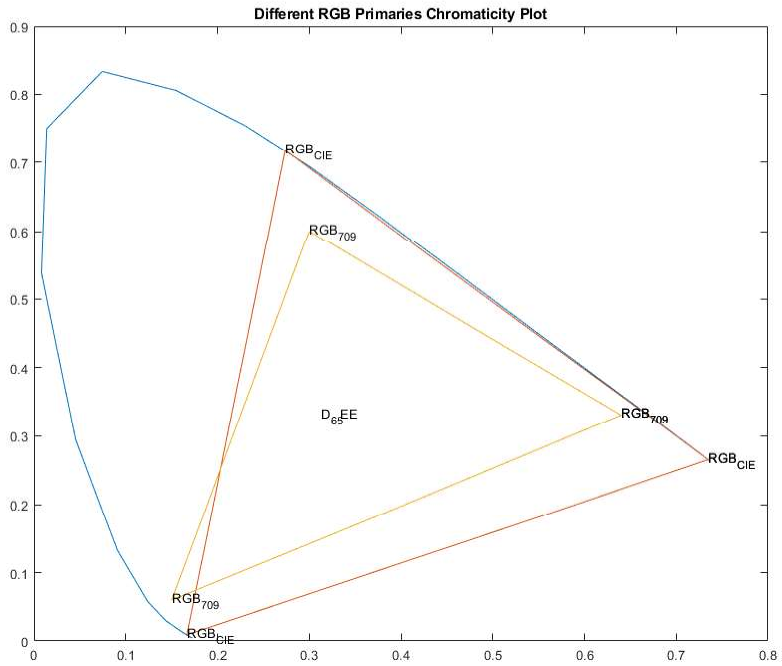
1.2 Plot of $l_0(\lambda), m_0(\lambda), s_0(\lambda)$ color matching functions



1.3 Plot of D_{65} and Fluorescent Illuminants



2 Chromaticity Diagram

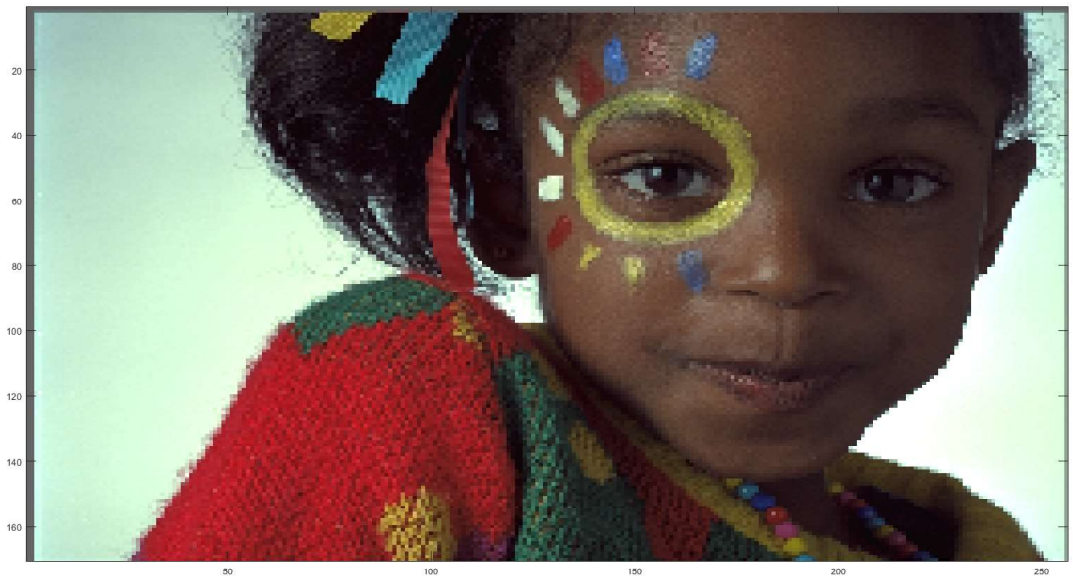


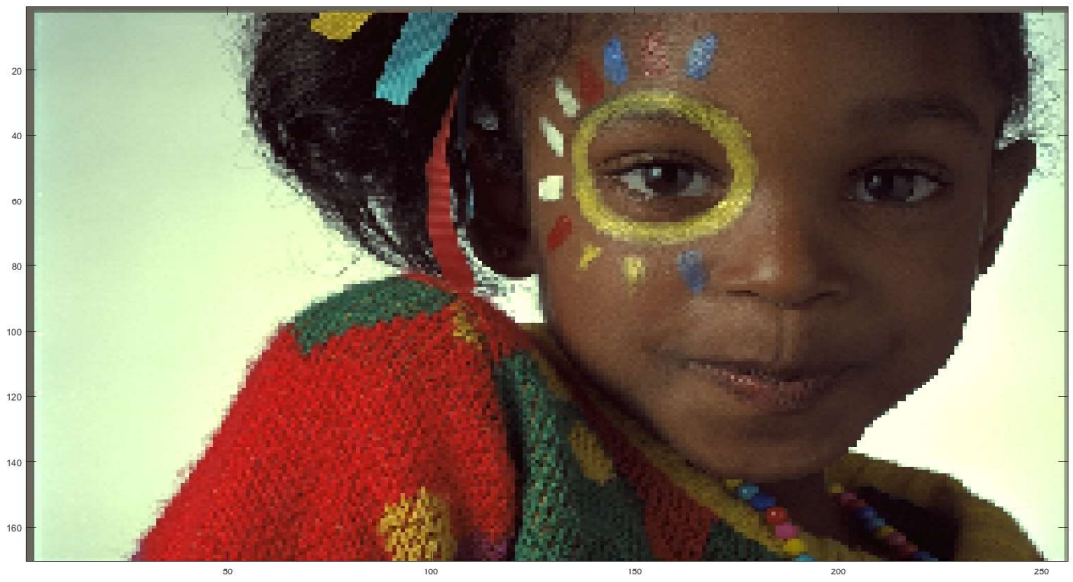
3 Rendering an Image from Illuminant, Reflectance and Color Matching Functions

3.1 M_{709_D65} Matrix

$$M_{709\_D65} = \begin{bmatrix} 0.4124 & 0.3576 & 0.1805 \\ 0.2126 & 0.7152 & 0.0722 \\ 0.0193 & 0.1192 & 0.9505 \end{bmatrix} \tag{1}$$

3.2 Image Obtained from D_{65} light source





3.3 Qualitative description

The image obtained from D_{65} light source appears to be bluish. This is because its color temperature is about 6500K which is similar to average daylight. On the other hand, the image obtained from the fluorescent source appears to be more yellowish. Also the latter image seems a little brighter.

4 Color Chromaticity Diagram

4.1 Color Diagram