Meeting 11

Continuation meeting 10: Theoretical derivation of the motion blur function.

Lectures 24-26

- **Introduction to Color Image Processing. RGB Color Models. HIS Color Models. Converting colors from HIS to RGB.**

- **Pseudo-color Image Processing.**

- **Color transformations. Smoothing and Sharpening. Colors Segmentation.**
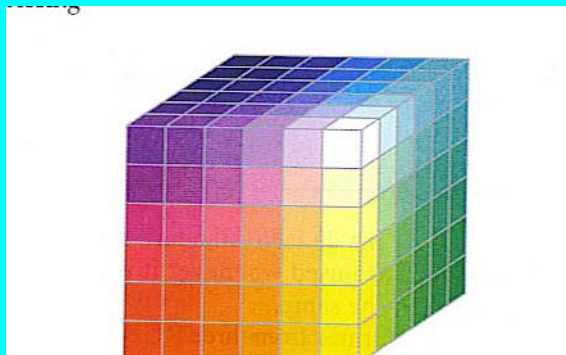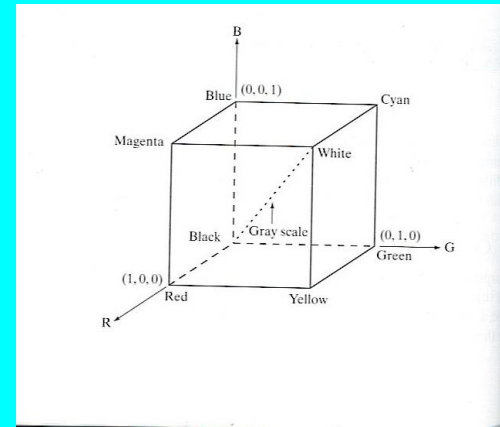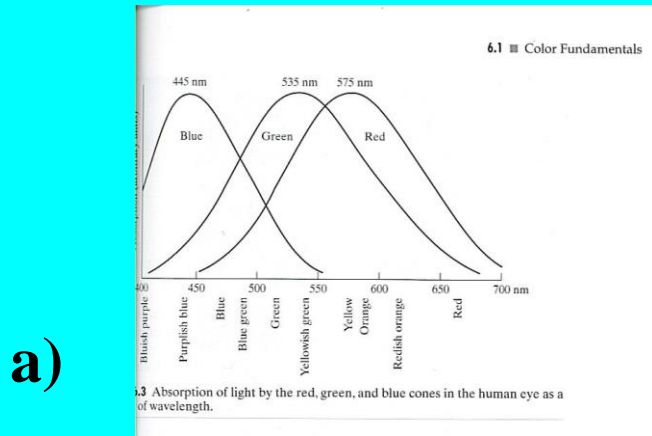
Colors' microwaves, RGB Model

a)

b)

c)

Figure 1. a) Absorption of lights; **b)** the RGB model; **c)** 216 RGB cube Model. (Digital Image Processing, 2nd E, by Gonzalez, Richard).
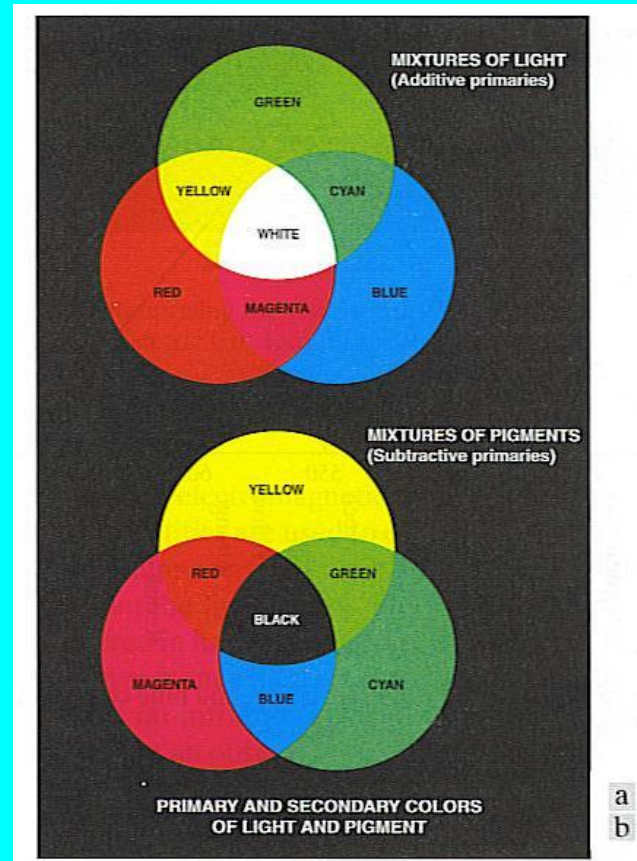
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Color Imaging Models

Figure 2. Primary and secondary colors of the RGB model.
(Digital Image Processing, 2nd E, by Gonzalez, Richard).

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Color Imaging Models

FIGURE 6.5 Chromaticity diagram. (Courtesy of the General Electric Co., Lamp Business Division.)

(C.I.E. CHROMATICITY DIAGRAM)

SPECTRAL ENERGY LOCUS (WAVELENGTH, NANOMETERS)

GREEN

GOLD

WARM WHITE

COOL WHITE

DAYLIGHT

PINK

RED

POINT OF EQUAL ENERGY

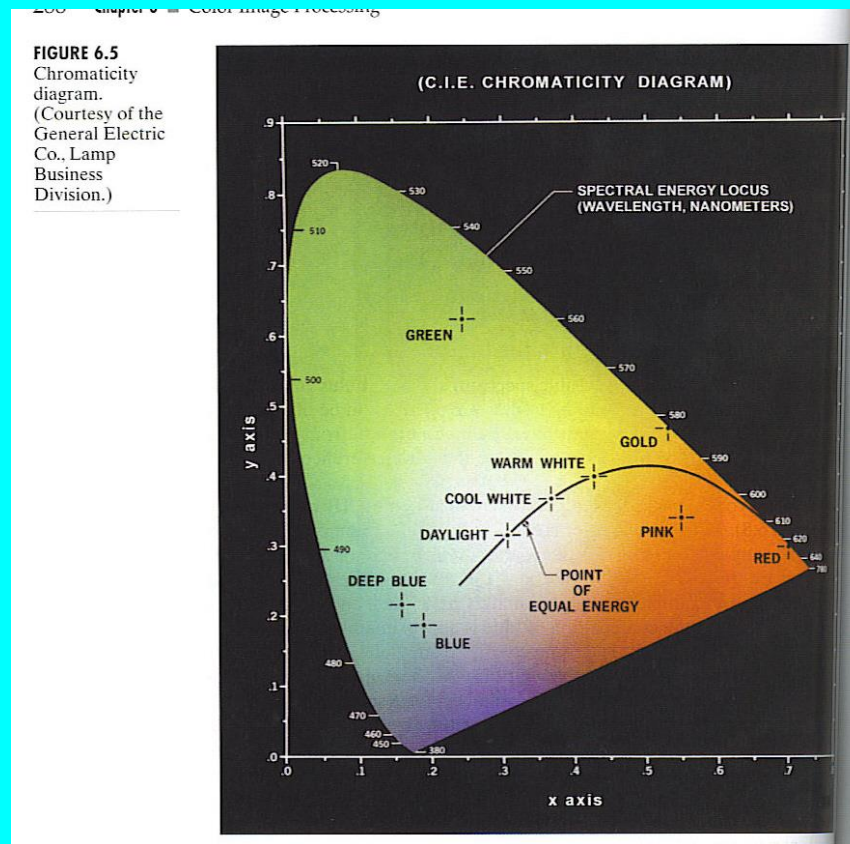DEEP BLUE

BLUE

y axis

x axis

Figure 3. Chromaticity diagram. A straight line between every pair of inner points, in the diagram, defines all the different colors that could be obtained by combining additively the colors of the end points.

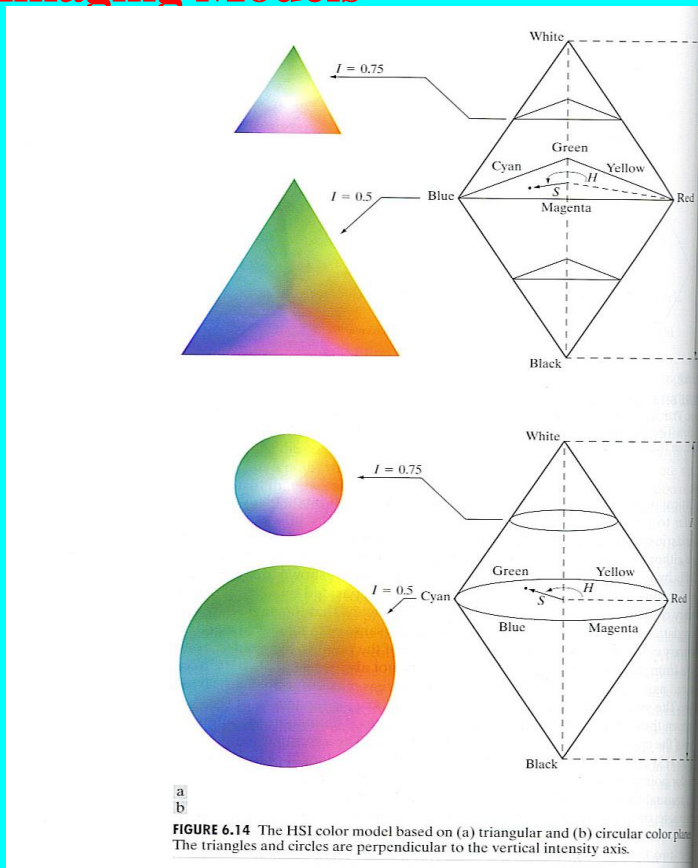(Digital Image Processing, 2nd E, by Gonzalez, Richard).

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FIGURE 6.14 The HSI color model based on (a) triangular and (b) circular color plane. The triangles and circles are perpendicular to the vertical intensity axis.

Figure 4. Hue, Saturation, Intensity model.

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RGB-HIS models

FIGURE 6.16 (a) RGB image and the components of its corresponding HSI (b) hue, (c) saturation, and (d) intensity.
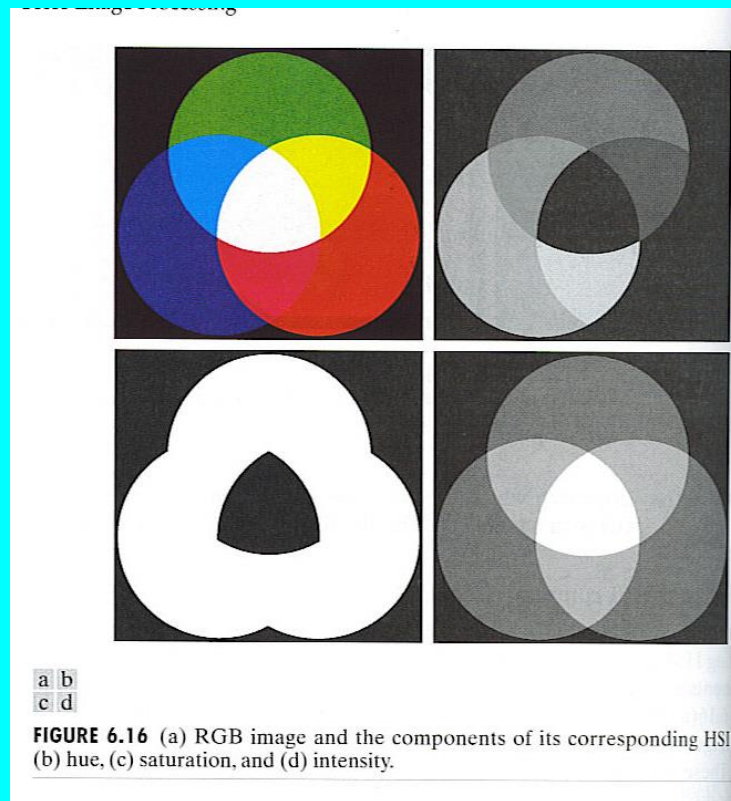
Figure 5. The correlation between RGB and HIS models.
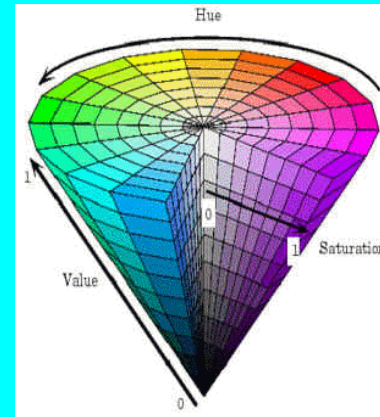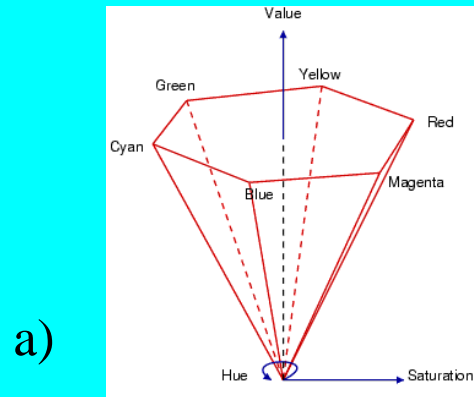
a)

b)

Figure 6 a). and Figure (b) a view of the HSV color model.

HSV - Hue, Saturation, and Value

The Value represents intensity of a color, which is decoupled from the color information in the represented image. The hue and saturation components are intimately related to the way human eye perceives color resulting in image processing algorithms with physiological basis.

Felzenszwalb, Huttenlocher," **Efficient Graph-Based Image segmentation**", Int. Journal of Computer Vision, Volume 59, Number 2, September 2004.

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