COMPUTER GRAPHICS

Lecture 2:

The basic concepts of Computer Graphics

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Content

2.1. Mechanism for displaying images

2.2. Color model

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2.1 Mechanism for displaying images

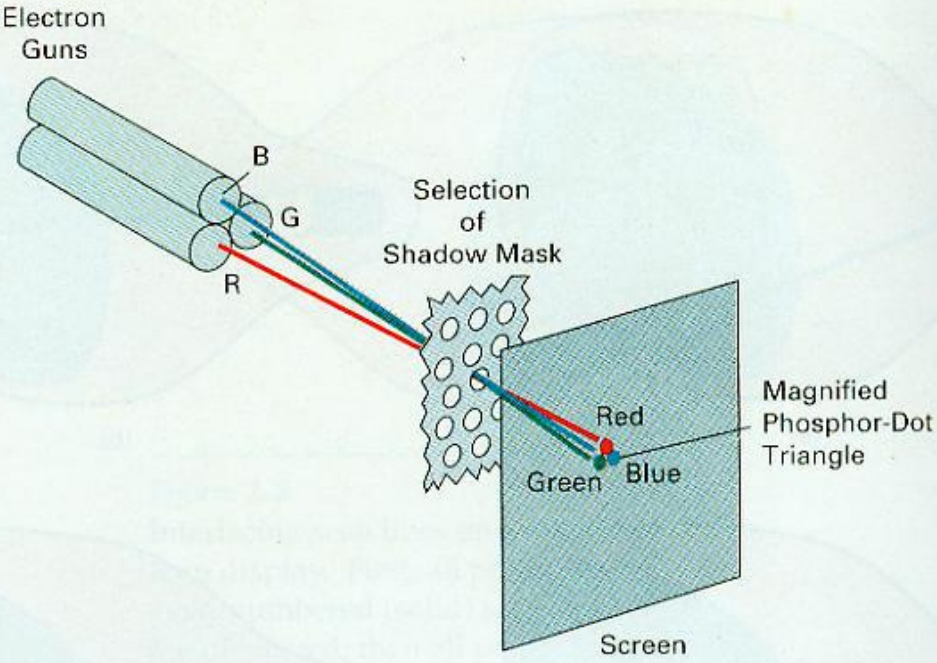
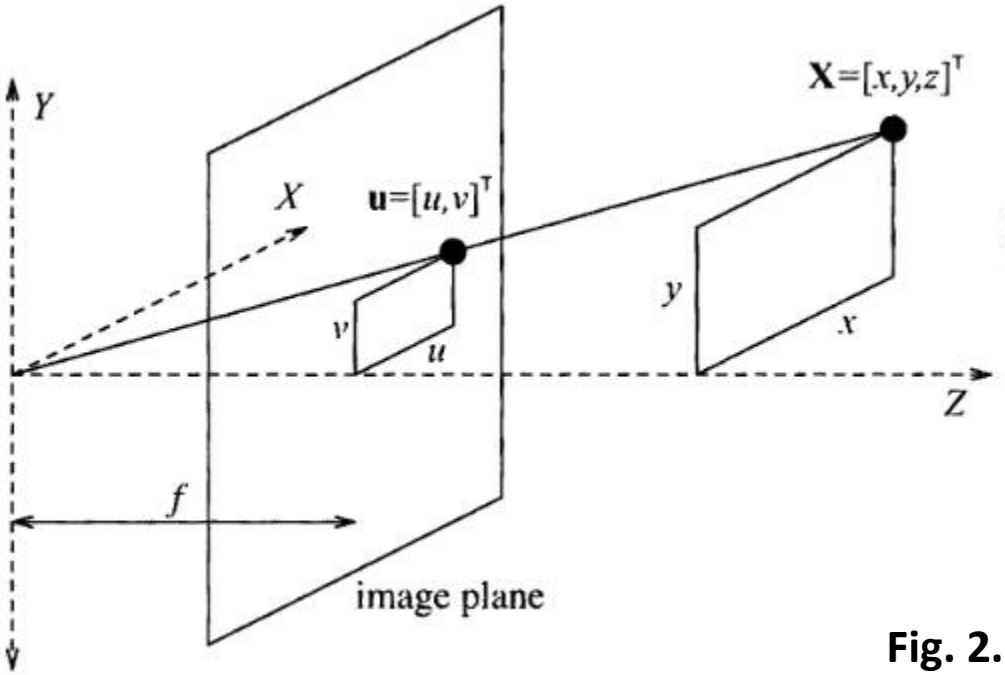


Fig. 2.1

Operation of a delta-delta, shadow-mask CRT. Three electron guns, aligned with the triangular color-dot patterns on the screen, are directed to each dot triangle by a shadow mask.

2.1 Mechanism for displaying images



$$u = \frac{x\,f}{z}, \qquad v = \frac{y\,f}{z}.$$

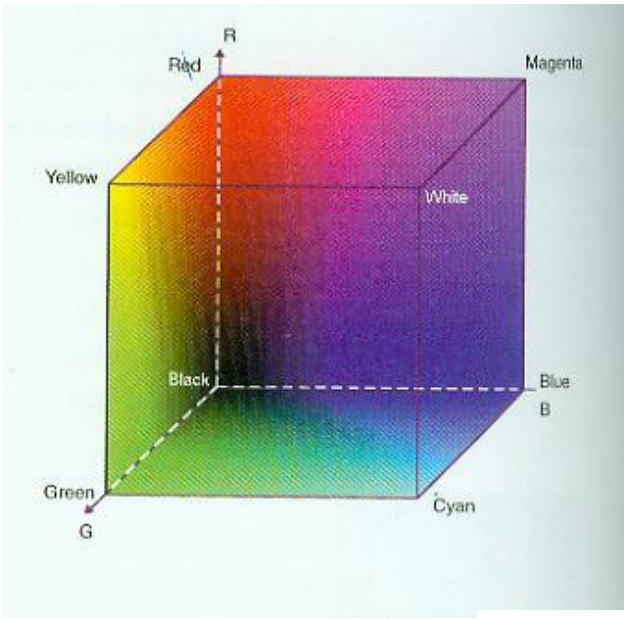
Fig. 2.2. Perspective projection geometry.

2.2. Color model

RGB Color Model

The color values at the pixel are composed of a triple of value (R,G,B),

R,G,B ϵ [0..255].



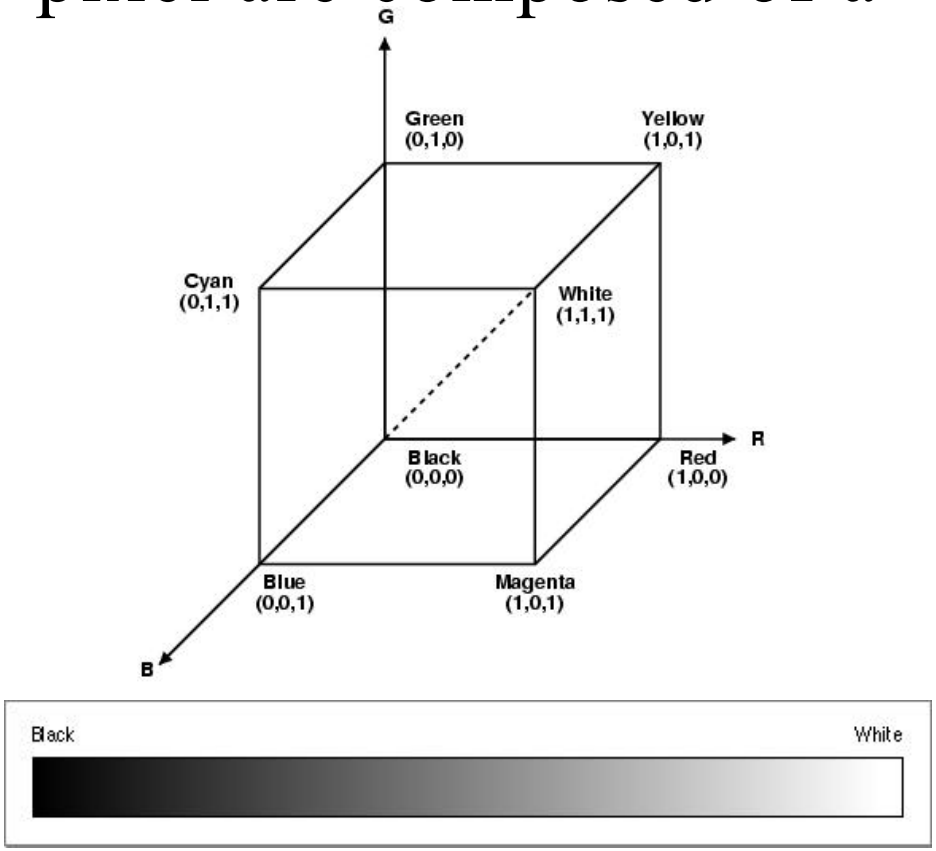


Fig. 2.3. RGB Color model

2.3. Coordinate System

- World Coordinate System (**WCS**).
- User Coordinate System (**UCS**).
- Display Coordinate System (**DCS**).

2.4. The basic graphics primitives

2.4.1. The basic geometry entities

- Point.
- Line,
- Arc (Circle, Ellipse)
- Bezier
- Hatch

2.4. The basic graphics primitives

2.4.2. Entity Attributes

- Color.
- LineWidth.
- LineStyle.
- Hatch pattern

2.4. The basic graphics primitives

2.4.3. The basic geometry transformations

- Translation.
- Rotation.
- Scale.
- Mirror.
- Shear

2.4. The basic graphics primitives

2.4.3. Two-Dimensional Viewing, Three-Dimensional Viewing

- Zoom, pan
- ViewToWin, WinToView,
- Parallel and Perspective Projection.