The Art and Science of Depiction

Tone and color system

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Color and Tone System

Tone & color system
**Representation systems**

- Drawing and projection
- Denotation
- Tone & color

**Tone & color system**

- (Often a mix)
- Extrinsic
- Intrinsic
- Symbolic
Extrinsic color

- Renzo Piano
  Tjibaou cultural center
  1991-98

Extrinsic black and white

- Gordon Park,
  Red Jackson
  Gang Leader
Optical intrinsic

- Boticelli *Primavera* 1482

Pure intrinsic colors

- Jawlensky  
  *Girl with Peonies*  
  +symbolic+harmony
**Plan**

- Intro
- Shading
- Shadows
- Atmospheric perspective
- Light transfers
- Photography

**Why a separate system?**

- Willats discusses it only/mainly for the optical denotation system
- But historically it is the major issue with drawing
- It is clearly a different problem from that of dimension and denotation
- Relevant as well for other denotation systems
Denotation system and tone & color

- Silhouette: color of the regions
- Line drawing
  - Line color
  - Line thickness
- Optical
  - Point color & tone
  - Texture
- More an “attribute system” than just tone & color
Denotation system and tone & color

- Braque Un Poeme Dans Chaque Livre
Denotation system and tone & color

- Amedeo Modigliani
  *Tete et buste de profil avec boucle d'oreille*
  1912
**Picture color dimensions**

- Tone
- Hue
- Saturation
- Simultaneous contrast
- Texture

**Beyond color**

- Material properties
- Painting
- Gold
- Etc.
Color origin

- Physical extrinsic
- Physical intrinsic
- Symbolic/importance
- Color harmony
- Limitation compensation (or accentuation)

Color and symbol
**Issues**

- **2D/3D**
  - 2D color composition
  - Color linked to the 3D scene

- **Per mark/per primitive**
  - Is the color constant on a mark?
  - Is it constant on a primitive?
  - Does it vary in the mark

**Example**

- Paul Klee
  - *Hoffmanneske Szene*
  - 1921
**Example**

![Example Image](image)

**Palette and medium**

- Different media permit different ranges of colors
  - E.g. pastels, pencil, watercolor, b/w photo
- The medium can be chosen for the palette
Color and aging

• Michelangelo The Creation of Adam 1508-1512

Restoration
Church and color

Tone & color system 27

Church and color

Tone & color system 28
**Light in the scene**

- Intrinsic reflectance
- Different light sources
- Outgoing light
- Shadows
  - Self shadows
  - Cast shadows
- Shading
- Inter-reflection
- Atmospheric perspective

**Constancy and scene analysis**

- Segmentation into layers
  - Illumination
  - Reflectance
  - Transparency
Light

- Point light source
- Directional light source (sun)
- Extended light source
- Hemispherical light source (sky)
- Ambient light
- Global illumination

Light

- Fall-off
- Attenuation
**Plan**

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**Light and shape depiction**

- Shading
- Highlight
- Shadow
- Inter-reflection

**Shading & BRDF**

- Bi-Directional Reflectance distribution function
- Ratio of light arriving from one direction bouncing in another direction
- 4D function (2*2 angles)
**Shading & BRDF**

- 2 main components
  - Diffuse (omni-directional)
  - Specular (directional) : highlight

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**Shading & BRDF**

- Diffuse
  - Depends on angle between light and normal
Chiaroscuro

• Andreas Mantegna, *Madonna and Child with St John the Baptist and Mary Magdalene*, 1495
**Saturation shading**

- Andreas Mantegna, *Madonna and Child with St John the Baptist and Mary Magdalene*, 1495

**Shading and make up**
Shading and corrective lighting

Lighting and shading

- Alfred Krupp photographed in 1963 by Arnold Newman
- Because Krupp had benefited from the nazis
- Un-friendly lighting
Plan

• Intro
• Shading
• Shadows
• Atmospheric perspective
• Light transfers
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Shadow

Plate 18
David Allan,
The Origin of Painting
(The Maid of Corinth),
1775. Oil on wood,
38.7 x 31 cm. Edinburgh,
National Gallery of Scotland.
**Shadow**

- Self, cast and attached shadows
  - (or primary and secondary, double shadow, etc.)
- Not local
- Can be distracting
- Have been depicted or not depending on period

- Hard/soft shadow

**Self and cast shadow**

[Diagram of self and cast shadow]
Soft shadow

Shadow

• Pozzo
Shadows

- 18th century
- Lambert
Shadow

• Raphael vs. Master of the Mornauer

Tone & color system

Shadow

• Campin, *Trinity* 1427-32

Tone & color system
**Shadow**

- Caravaggio The Supper at Emmaus 1601

- Guardi 1755
Shadow

• Rembrandt
Shadow

- Follower of Rembrandt A Man seated reading at a table in a lofty room 1631-50

Shadow & Trompe-l’oeil

- Rembrandt
Shadow & Trompe-l’oeil

Tone & color system

Shadow reveal shape

Tone & color system
Colored shadow

Shadow reveal
Shadow reveal

Plate 52 Grandville, The Shadoes (The French Cabinet) from La Caricature, 1830.

Tone & color system
**Shadow**

- [Waltz 75]

**Plan**

- Intro
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- Atmospheric perspective
- Light transfers
- Photography
Atmospheric perspective

- Saturation
- Hue
- Precision

Atmospheric perspective

- Leonardo
Atmospheric perspective

• Titian, Bacchus

• R. Earlom, Pastoral Scene, 1774
Plan

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Global illumination

- Light inter-reflection
- Each surface is a secondary light source
- Crucial for indoor scenes
Global illumination

Tone & color system

Global illumination

Tone & color system
Global illumination

Counter-example: painting with light
Global illumination & production

- Mostly unused
- Because artists want local control
Plan

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Three Point Lighting

- Key light
  - Main and visible lighting
- Fill light
  - Fill-in shadows
- Back light
  - Emphasize silhouette
  - Make subject stand out
- Independent lighting
**Portrait lighting**

- Snapshots
- Perspective
- Speed
- Aperture
- Lighting
- Processing
- Print
- Make-up
- Retouching

**Filter for black and white**

- Snapshots
- Perspective
- Speed
- Aperture
- Filter
- Lighting
- Processing
- Print
- Make-up
- Retouching
**Dodging and Burning**

- Clearing Winter Storm

**Haze filtering**

- Haze is bluish
Example

• Edgar Degas
  *Ballet Dancer in Position facing 3/4 front*
  1872

Example

• Tom Purvis 1935