The Art and Science of Depiction

There Is No Passive Recording

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There is no passive recording
Introduction

• The quest for realism
  – Since the Greeks
  – Renaissance
  – Photography
  – Computer Graphics

• The myth of the naked eye

• Is there a perfect realism?

• Degrees of freedom of photography
Overview

• Show all the controls of photography
• Raise issues, install doubt about realism
• We will revisit these points through the class
Plan

- Snapshot
- Perspective
- Speed and aperture
- Filter
- Lighting
- Processing and Print
- Make-up
- Retouching
- Discussion

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Snapshot

- The “decisive moment”
  (Cartier Bresson)
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**Snapshot**

- Freeze the action
- Is it realistic?
- This is reality though
Viewpoint

• 2D composition
Viewpoint

- High viewpoint

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Viewpoint

• The choice of the viewpoint is not innocent

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Snapshot - Perspective - Speed, aperture - Filter - Lighting - Processing & Print - Make up - Retouching
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**Snapshot** - Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching

**Viewpoint**

- Same event
- Two radically different photographs
Special effects

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
Plan

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- Discussion
Perspective vs. viewpoint

- Focal lens does NOT ONLY change subject size
- Same size by moving the viewpoint
- Different perspective (e.g. background)
Perspective vs. viewpoint

• Martin Scorcese, Good Fellas
Perspective vs. viewpoint

- Portrait: distortion with wide angle

Wide angle  Standard  Telephoto
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Architectural perspective

• Problem: converging verticals
• Normal since we look upwards
• But disconcerting
Architectural perspective

- Solution: view-camera
- Lens shifted with respect to film
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
**Architectural photography**

- 35mm SLR version
Digital perspective correction

- Photoshop, distort
Digital perspective correction

- Photoshop, distort
- Can be done traditionally
**Perspective distortion**

- Exterior columns appear bigger
- The distortion is not due to lens flaws
- Problem pointed out by Da Vinci
**Perspective distortion**

- The sphere is projected as an ellipse
Perspective distortion

• The sphere is projected as an ellipse
Perspective distortion

- The photo of the photo looks distorted
- But the photo does not...
Special effect

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Rетouching
Special effects

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
Special effect: Ames room

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Snapshot-**Perspective**-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
Plan

• Snapshot
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• Discussion
Exposure

• Reciprocity speed-aperture
Speed

- Slow shutter, motion blur
Speed

• Fast shutter, freeze motion
**Depth of field**

- Depends on aperture and lens
- Selective focus
**Depth of field**

- Complete focus
- Never happens for human vision
**Depth of field**

- Selective focus
- In reality, we would be able to shift focus
- This is refused to us
- The photographer rules
Plan

- Snapshot
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Filter

- Diffusion
- Focus the attention
Gradient Filter

• The sky is too bright
Gradient Filter

- The sky is too bright
  - Gradient filter for the top of the photo
Gradient Filter

• The sky is too bright
  – Gradient filter for the top of the photo
• The house is too dark
**Gradient Filter**

- The sky is too bright
  - Gradient filter for the top of the photo
- The house is too dark
  - Gradient filter for the bottom of the photo
Stardust filter

• Emphasize the brightness of the flare
Polarizing filter

- Control reflection
- Depending on orientation
Polarizing filter

- Control reflection
- Darken sky
- Depending on orientation

To find the part of the sky that can be most darkened with a polarizing filter, point your shoulder at the sun. The sky directly in front and behind you can be most darkened. If the sun is near the horizon, the sky overhead can also be darkened.
Haze filtering

- Haze is bluish

No filter  Blue filter  Red filter
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching.
Plan

• Snapshot
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Photography Lighting

- Provide enough light
- Fill-in shadows
- Model the shape
- Reveal texture
- Install ambiance
Available light

- Not always possible
  - Not enough light
- Selection
  - Sunset, sunrise, overcast skies
- Orientation with respect to the subject
Time of Day

- 8 am
Time of Day

• 10 am
Time of Day

- 12:30 pm
Time of Day

- 2:30 pm
Time of Day

- 3:30 pm
Time of Day

- 4:30 pm
Time of Day

• 4:30 pm
Dynamic range

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
There is no passive recording. Snapshots, perspective, speed, aperture, filter, lighting, processing, and print-making are all essential steps in the photography process, including retouching.
There is no passive recording. Snapshots-Perspective-Speed, aperture-Filter-Lightning-Processing & Print-Make up-Retouching.
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

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Portrait lighting

- Strong back light
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Counter-example

• The Godfather
Counter example

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

- Snapshot
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Discussion
Processing and printing

- Limitation of contrast
  - Typically 1 to 300
  - Reality often exhibits 1 to 10,000
Tone Reproduction

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
The Zone System

The Zones
- 0 Solid black; the same as the film rebate
- I Nearly black; just different from Zone 0
- II The first hint of texture
- III Textured shadow; the first recognizable shadow detail
- IV Average shadow value on Caucasian skin, foliage and buildings
- V Middle grey: the pivot value; light foliage, dark skin
- VI Caucasian skin, textured light grey; shadow on snow
- VII Light skin; bright areas with texture, such as snow in low sunlight
- VIII Highest zone with any texture
- IX Pure untextured white

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
Tone Reproduction

- Not linear
Tone Reproduction

- Not linear
- Gamma correction

![Diagram of tone reproduction]

- Log luminance
- Log print density
- Linear path
- Gamma correction curve
- Shoulder, Toe, Highlight, Shadow
The Print

• W. Eugene Smith photo of Albert Schweitzer
• 5 days to print!
**Dodging and Burning**

- During the print
- Locally darken or lighten
- Use masks to expose some parts less
- Has to be done for each print!
Dodging and Burning

• Clearing Winter Storm
Dodging and Burning

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
Edge burning

• Darken the edges
• Focus the attention, make the photo dynamic
Plan

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Facial problems in CGI

- E.g. Toy Story humans look bad
- Measurement of human reflectance

Measurement of human skin reflectance at Cornell University
Make-up

- Scars, monsters, etc.
- “Creative” make-up
  - Fancy!
- Corrective make-up
  - Hide wrinkles, etc
  - Balance the face
  - Not limited to the face!
- Make-up for pictures
  - Avoid highlights
Shading and highlighting
Corrective Make Up

- Depending on the shape of the face
Corrective lighting
An example

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
Is it fair?

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
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Retouching

• Politics...
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-Retouching
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up

**Touch-up: too dark face**
Touch-up: silhouette
Touch-up: undesirable lines
Touch-up: stretch and arm

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-**Retouching**
Deforming lens

- Deform one part of the frame
- Stretched arm and legs
Touch-up: symmetry
Symmetry

Original portrait  Two right halves  Two left halves

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Personal gallery

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Personal gallery

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-**Retouching**
Personal gallery

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up - Retouching
Personal gallery

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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up-\textbf{Retouching}
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up—Retouching
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up - Retouching
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Snapshot-Perspective-Speed, aperture-Filter-Lighting-Processing & Print-Make up - **Retouching**
Plan

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- Discussion
Discussion

• What are we trying to control?
What are we trying to control?

- Perspective, composition
  - Viewpoint
  - Lens
  - View-camera, stretch, undistort
- Tones
  - Filter
  - Lighting
  - Processing and print
  - Make-up
  - Retouch
- Selection
Discussion

- Different ways to achieve an effect
- The end justifies the means
  - The final picture is the only criterion
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Assignment

- Un-distort perspective: distort
Assignment

- Wire
Assignment

- Distracting elements
Assignment: rubber-stamp

- Magical tool: rubber-stamp
Assignment

• Before

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Assignment

• After

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