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

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Plan

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

- Discussion

Snapshot

- The "decisive moment"
  (Cartier Bresson)

Snapshot

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

Viewpoint

- 2D composition

Photo
Peter Turner

Viewpoint

- High viewpoint

Viewpoint

- The choice of the viewpoint is not innocent

Viewpoint

- Same event
- Two radically different photographs

Special effects

Plan

- Snapshot
- **Perspective**
- Speed, aperture
- Filter
- Lighting
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Perspective vs. viewpoint

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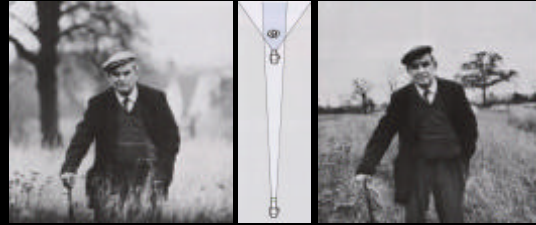
Perspective vs. viewpoint

- Martin Scorcese, Good Fellas

Perspective vs. viewpoint

- Portrait: distortion with wide angle

Wide angle   Standard   Telephoto

Architectural perspective

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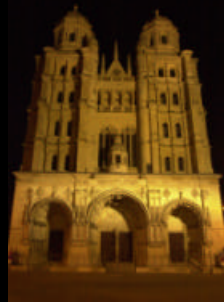
Architectural perspective

- Solution: view-camera
- Lens shifted with respect to film
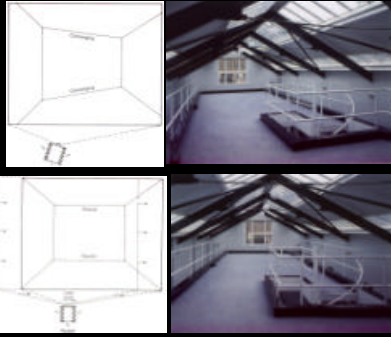
Architectural perspective

Architectural photography

- 35mm SLR version
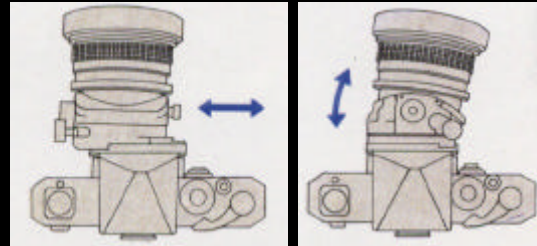
Digital perspective correction

- Photoshop, distort

Digital perspective correction

- Photoshop, distort
- Can be done traditionally
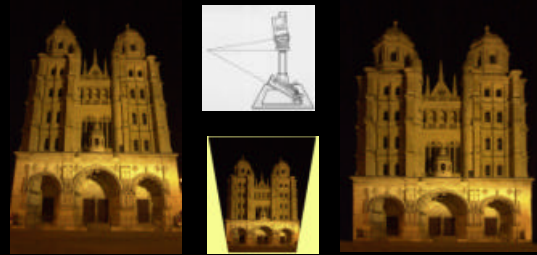
Perspective distortion
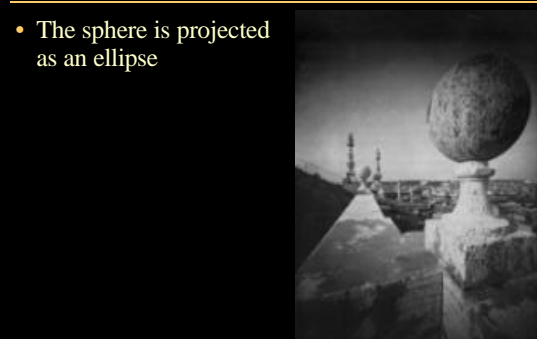
- Exterior columns appear bigger
- The distortion is not due to lens flaws
- Problem pointed out by Da Vinci

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

Special effects

Special effect: Ames room
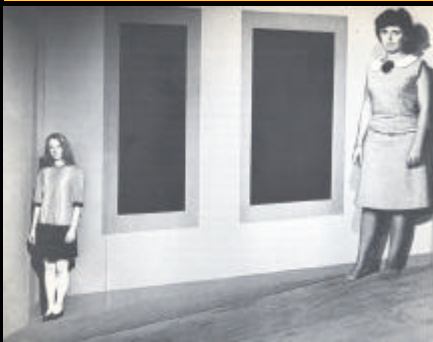
Plan

- Snapshot
- Perspective
- Speed, aperture
- Filter
- Lighting
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- Make-up
- Retouching

- 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**
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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

Haze filtering

- Haze is bluish

No filter   Blue filter   Red filter

Filter for black and white

Plan

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

- Discussion

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

Fill-in

Painting With Light

Three Point Lighting

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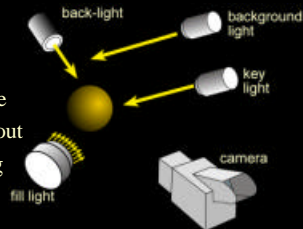
Portrait Lighting

Portrait lighting

- Strong back light

Portrait lighting

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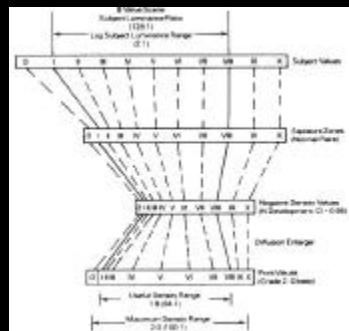- Retouching

- Discussion

Processing and printing

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

Tone Reproduction

The Zone System

Tone Reproduction

- Not linear

linear

Log print density

log luminance

shadow   highlight

Tone Reproduction

- Not linear
- Gamma correction
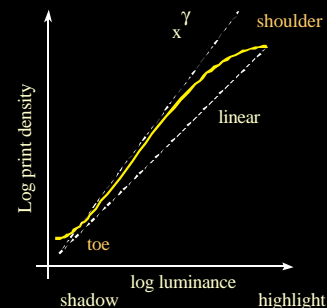
x^γ shoulder

linear

Log print density

toe

log luminance

shadow   highlight

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

Edge burning

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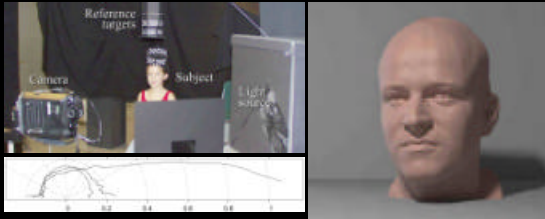
Plan

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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

Is it fair?

Plan

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

- Discussion

Retouching

- Politics…

Fakery

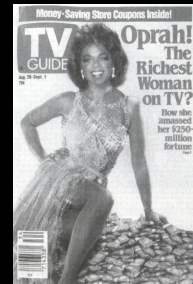- Nessy
- Oprah

Touch-up: too dark face

Touch-up: silhouette

Touch-up: undesirable lines
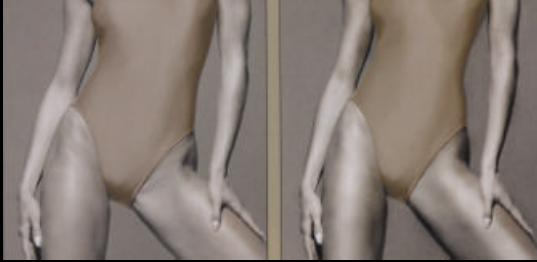
Touch-up: stretch and arm

Deforming lens

- Deform one part of the frame
- Stretched arm and legs

Touch-up: symmetry

Symmetry

Original portrait   Two right halves   Two left halves

Personal gallery

Personal gallery

Personal gallery

Personal gallery

Photo-montage

Photo-montage

Photo-montage

Plan

- Snapshot
- Perspective
- Speed, aperture
- Filter
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- Processing and Print
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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
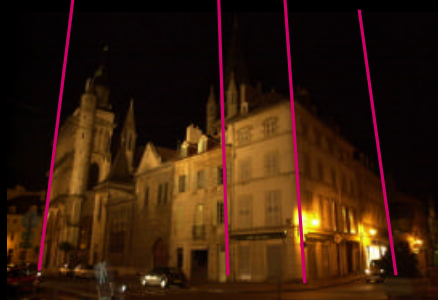 - The final picture is the only criterion

Assignment

Assignment

- Un-distort perspective: distort
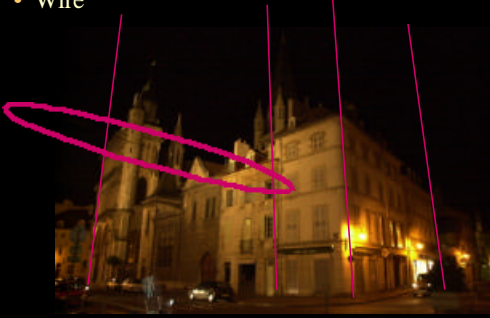
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Assignment

- Wire
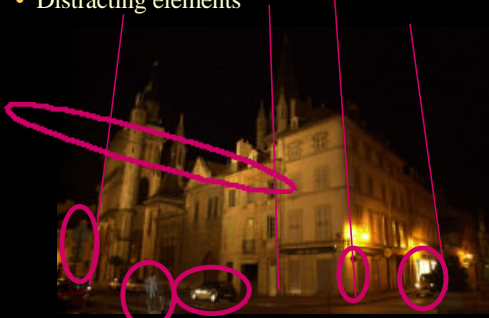
Assignment

- Distracting elements
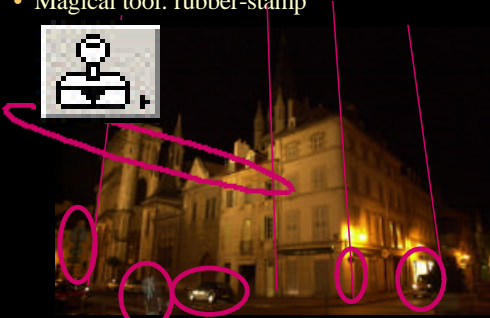
Assignment: rubber-stamp

- Magical tool: rubber-stamp

Assignment

- Before

Assignment

- After