Assignments for Monday 30.
• Solso *Cognition and the Visual Arts*
  – Chapter 8 & 9
• Final project
  – Firm subject

Plan of the next sessions
• Drawing and projection
• Denotation
• Tone & color

Plan
• Intro to perspective
• History of Renaissance perspective
  – Early attempts
  – Brunelleschi
  – Alberti
  – De la Francesca
  – Leonardo
  – Dürer
• Gadgets
• Distortion issues

Does linear perspective “occur” in nature
– E.g. we “experience” foreshortening
• Perspective or perspectives?
**Pictorial depth cues**

- Occlusion
- Size
- Position relative to the horizon
- Convergence of parallels, linear perspective
- Shading, shadow
- Texture gradient
- Aerial perspective

**Introduction to Perspective**

- Importance of the single viewpoint

**Linear Perspective**

- Image as a window
- *St Jerome In His Study*
  Antonello da Messina 1475

**Some accompanying concepts**

- Viewpoint
- Foreshortening
- Vanishing point
- Very linked to architectural spaces

**Primary/secondary geometry**

- Primary geometry
  - Description in 3D object-space
- Secondary geometry
  - Description in 2D image-space

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Early attempts

- St John the Baptist Retiring to the Desert
  Giovanni di Paolo 1454

- Giotto, 1297-1299

- Lorenzetti 1337-1340

Giotto’s rules

- Lines and planes above eye level incline downwards when they move away
- Below eye level upwards when they move away
- Lines to the left incline inwards to the right

- Confirmation of the Rule of St Francis 1325
Giotto

- Confirmation of the Rule of St Francis 1325

Early attempts

- Pietro Lorenzetti, Birth of the Virgin 1342

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Bruneleschi’s experiments, 1413

- Existing buildings
- Measurement, surveying
- Single viewpoint
- First scientific mimesis

Bruneleschi’s second experiment

- Cut out
- Note that this is 2-point perspective
Limitations

- Existing buildings
- Requires measurement

Masaccio, The Trinity, 1427

- The oldest perspective painting
- Probably measurement
- Maybe helped by Brunelleschi

Masaccio, The Trinity, 1427

- The oldest perspective painting
- Santa Maria Novella (Florence)

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Leon Battista Alberti, On Painting

- 1435
- Intersections of pyramids with image surface
- Proportional triangles
- Use side view for foreshortening
- Check with diagonal
- Use pavement as reference
- Center = prince of rays
**Leon Battista Alberti**, *On Painting*
- Paolo Uccello, *The Selling of the Host*, 1468

**Legitimate construction**
- Carlo Crivelli, *Annunciation*, 1486

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**Piero de la Francesca**
- *De Prospectiva Pingendi*, 1474
  (On the perspective of painting)
- Ratios of distance and size
- Use plan and elevation view

**Piero de la Francesca**
- Use plan and elevation view
- Deformation of square
  - Angle of view less than 90°
Perspective 37
Piero de la Francesca

- *Flagellation of Christ*, 1460

Perspective 38
Piero de la Francesca

- Invention of the true cross 1452-59
- "wrong perspective on the left"

Perspective 39
Piero de la Francesca

- Invention of the true cross 1452-59
- "wrong perspective on the left"

Perspective 40
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Perspective 41
Leonardo & perspective

- Techniques of artists’ perspective in theory and practice
- Geometry of visual rays
- Devices and instruments
- Optics and the eye
- Curiosities of vision (e.g. anamorphosis)
- Apparent contradictions

Perspective 42
Leonardo

- *Last Supper*, 1497
**Leonardo**

- **Last Supper, 1497**

**Leonardo & contradictions**

- **Wide angle vision**

**Leonardo & contradictions**

- **Wide angle vision**
- **Lateral recession**

**Plan**

- **Intro to perspective**
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**Dürer**

- **Traveled to Italy**
- **Mainly influenced by de la Francesca**
- **Instruction in Measurement with Compass and Ruler in Lines, Planes and Solid Bodies, 1525**
Perspective 49

Dürer
- *St. Jerome in his Study* 1514
- Very off-center
- Note the verticals

Perspective 50

Dürer
- The artist’s glass

Perspective 51

Dürer
- The draftsman’s net

Perspective 52

Dürer
- Jacob de Keyser’s invention

Perspective 53

Dürer
- Dürer’s device

Perspective 54

Conclusions about Renaissance
- Different techniques, refinement
- Measurement
- Mainly central perspective
- No notion of infinity, no vanishing point
- Spiritual notion of mathematical harmony
After Renaissance

• 17th
  – Vanishing point
  – Abstraction
  – Desargues, Descartes
• Flourished until 19th
• 20th century
  – Come-back for computer graphics and computer vision

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Gadgets

• Camera obscura

Vermeer 1660

• Camera obscura

Gadgets

• Baldassare Lanci’s universal instrument for surveying and perspective 1557
**Gadgets**
- Camera Lucida
- E.g. Talbot

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**Leonardo & contradictions**
- Wide angle vision
- Lateral recession
**Perspective distortion**

• The sphere is projected as an ellipse