### CS4620/5620: Lecture 6

Perspective

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Announcements

- HW I out
  - -Due in two weeks (Mon 9/17)
  - Due right before class
  - -Turn it in online AND in class (preferably)

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# **History of projection**

- Ancient times: Greeks wrote about laws of perspective
- Renaissance: perspective is adopted by artists



Duccio c. 1308

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### **Ray generation vs. projection**

- Viewing by projection
  - -start with 3D point
  - compute image point that it projects to
  - -do this using transforms
- Viewing in ray tracing
  - -start with image point
  - -compute 3D point that projects to that point using ray
  - do this using geometry
- Inverse processes

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#### Choice of field of view

- In photography, wide angle lenses are specialty tools
  - -"hard to work with"
  - easy to create weird-looking perspective effects
- In graphics, you can type in whatever f.o.v. you want
  - -and people often type in big numbers!



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# Specifying perspective projections

• Many ways to do this

- common: from, at, up, v.f.o.v. (but not for shifted)

- One way (used in ray tracer):
  - -viewpoint, view direction, up
    - establishes location and orientation of viewer
    - view direction is the direction of the center ray
  - -image width, image height, projection distance
    - establishes size and location of image rectangle