Multi-Perspective Images

Images that depict **more** than can be seen from any **single** viewpoint, yet remain interpretable

--- J. Yu

Motivation

- Artists often deviate from perspective projection
  - Alter projection for each object
  - Curvilinear, nonlinear, inverted
- Express mood, feeling, idea
- Improve comprehensibility
- Visualize spatial relationships

Giorgio de Chirico’s *Mystery and Melancholy of a Street*
Artistic Expression

- Viewing Anomalies
  Cezanne’s Still Life with Fruit Basket

van Eyck’s “Ghent Alterpiece” (1432)


Hans Holbein the Younger, The Ambassadors, 1533
Anamorphic Projection

2 Centers of Projection:
- Orthogonal PP
- Slanted PP

Hockney’s “Pearblossom Highway” (1986)

Hockney-style Collages

Multiple Parallel Projections

53rd Street Map (Guarnaccia 93)

Panography Group at Flickr.com
Multi-Perspective Cameras: Fisheye Lens Image

- Not a single optical center

Pushbroom Camera


Slit Panoramas

- Strip panoramas created by horizontally translating a 1D vertical strip camera past a planar scene
- Orthographic projection along horizontal axis; Perspective projection along vertical axis

- Main Problem:
  Different aspect ratio at different depth
  ⇒ closer squashed; further stretched

[ Roman 04, Ph.D. thesis 2006 ]
Multi-Perspective Images

A multi-perspective image incorporates many perspectives into a single, locally-coherent image. A moving window slides across the panorama, selecting frames for creating an animation.

Multi-Perspective Panoramas

from Disney’s film Pinocchio, 1940

Extracted frames
Multi-Perspective Panoramas

Fisherman’s Evening Song, Xu Daoning, 11th century

Long Scene Panoramas

• Street View - really long [Roman 04]

Parabolic Panoramas

parabolic panorama

Space-Time Images

Etienne-Jules Marey’s Chronophotographs, 1888

Andrew Davidhazy