Projection Theory

Perspective and Parallel Projections
Projection Theory

A projection is a mapping of a 3D space onto a 2D subspace:
- 2D space is called the projection plane
- Projection also refers to image resulting from such a mapping
Classification of Projections

Planar projections

Perspective projections
- One-point
- Two-point
- Three-point

Parallel projections
- Oblique
- Orthographic
  - Axonometric
    - Isometric
    - Dimetric
    - Trimetric
  - Multiview
    - General
Pictorial Views

A. Oblique

B. One-point perspective

C. Isometric

D. Two-point perspective
Common Elements of a Projection System

- Object/scene to be projected
- Projection Plane
- Projectors (sight lines)
- Projected 2D image
- Center of projection (not shown)
Converging versus Parallel Projectors

Converging Projectors

Parallel Projectors
Some Terminology

- **Bounding Box = Principal Enclosing Box (PEB)**
- **Center of Projection = Station Point = Viewpoint of observer**
- **Projection Plane = Viewplane = Picture Plane**
- **Projectors = Sight lines = Line of sight**
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