

CLASSICAL VIEWING

6.1 Classical Viewing

- 3 basic elements for viewing :
 - One or more objects
 - A viewer with a projection surface
 - Projectors that go from the object(s) to the projection surface

Classical views are based on the relationship among these elements

- Each object is assumed to be constructed from flat *principal faces*
 - Buildings, polyhedra, manufactured objects
 - Front, top and side views.

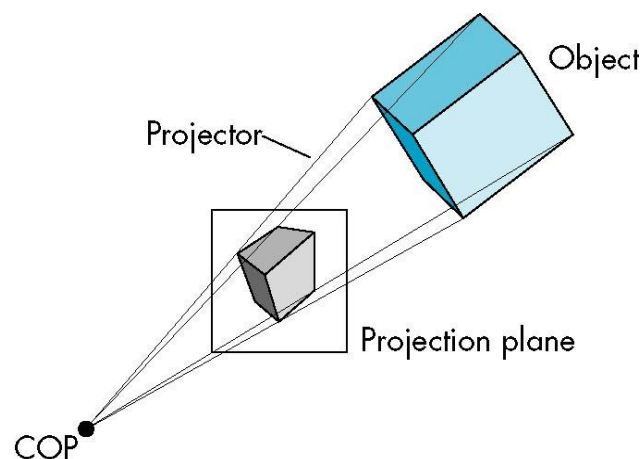
Planar Geometric Projections

- Projections : Standard projections project onto a plane
- Projectors : Lines that either converge at a center of projection or, are parallel (DOP)
- Nonplanar projections are needed for applications such as map construction

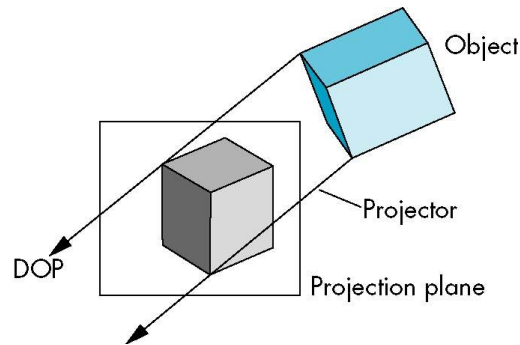
Perspective and parallel projections :

Parallel viewing is a limiting case of perspective viewing

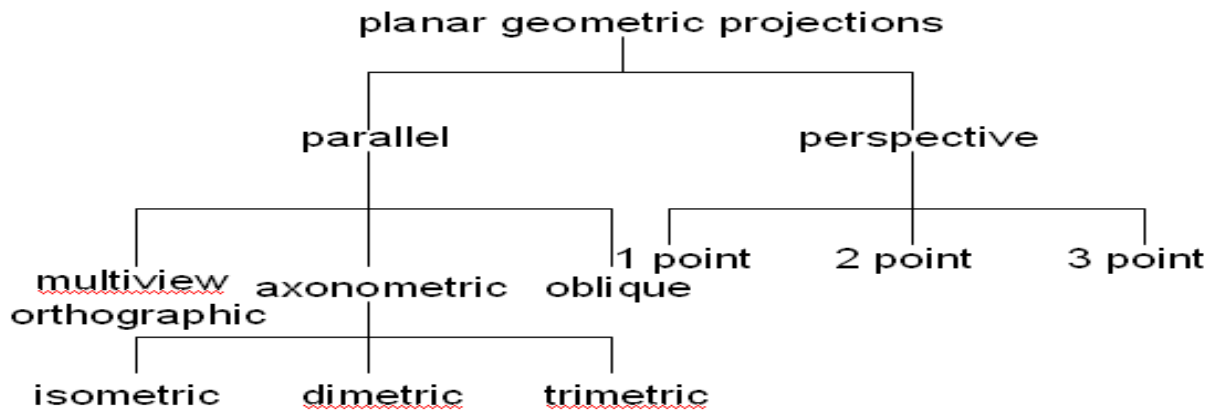
Perspective projection has a COP where all the projector lines converge.



Parallel projection has parallel projectors. Here the viewer is assumed to be present at infinity. So here we have a “Direction of projection(DOP)” instead of center of projection(COP).

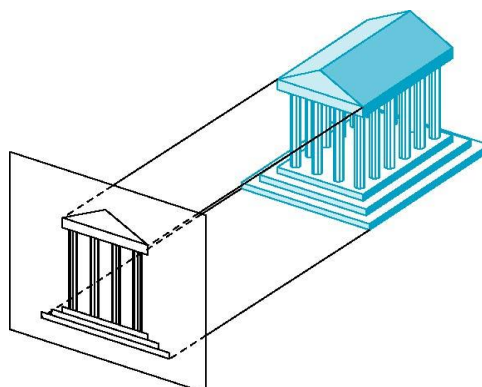


Types Of Planar Geometric Projections :



Orthographic Projections :

- Projectors are perpendicular to the projection plane.
- Projection plane is kept parallel to one of the principal faces.
- A viewer needs more than 2 views to visualize what an object looks like from its multiview orthographic projection.



Advantages and Disadvantages :

- Preserves both distances and angles
 - Shapes preserved
 - Can be used for measurements
 - Building plans
 - Manuals
- Cannot see what object really looks like because many surfaces hidden from view
 - Often we add the isometric

Axonometric Projections

- Projectors are orthogonal to the projection plane , but projection plane can move relative to object.
- Classification by how many angles of a corner of a projected cube are the same
 - none: trimetric
 - two: dimetric
 - three: isometric

Advantages and Disadvantages :

- Lines are scaled (*foreshortened*) but can find scaling factors
- Lines preserved but angles are not
- Projection of a circle in a plane not parallel to the projection plane is an ellipse
- Can see three principal faces of a box-like object
- Some optical illusions possible
- Parallel lines appear to diverge
- Does not look real because far objects are scaled the same as near objects
- Used in CAD applications