

## ① BSP Tree Method :-

(Binary Space Partitioning Tree)

Also painting the surfaces onto the screen from back to front.

Useful when the view reference point changes, but the objects in a scene are at fixed positions.

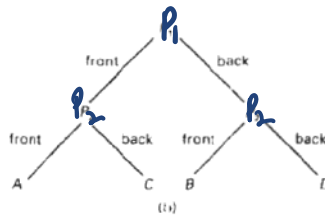
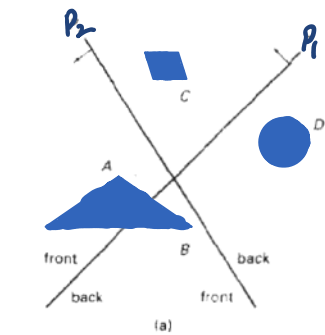


Figure 13-19  
A region of space (a) is partitioned with two planes  $P_1$  and  $P_2$  to form the BSP tree representation in (b).

Once the tree is complete, the tree is processed from back to front, so that foreground objects are painted over the background.

## ② Ray-tracing Method :-

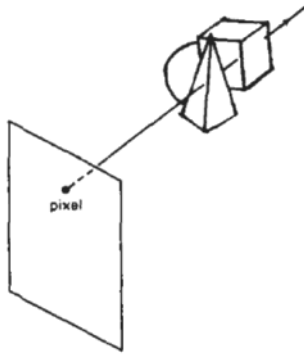


Figure 13-26  
A ray along the line of sight from a pixel position through a scene.

Determining the intersection of the object using the line of sight.

Visible surface is the one whose intersection point is closest to the pixel.

Ray Casting:- visibility-detection tool, based on geometric optics methods, which traces the paths of light rays.

③ Area sub-division method :-  
image-space method but object-space operations can be used to accomplish depth ordering of surfaces.

Area-coherence by locating those view areas that represent part of a single surface.

Successively dividing the total viewing area into smaller and smaller rectangles until each small area is projection of a single visible surface or no surface at all.

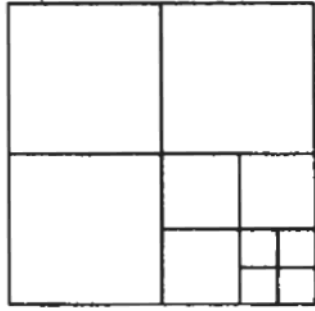
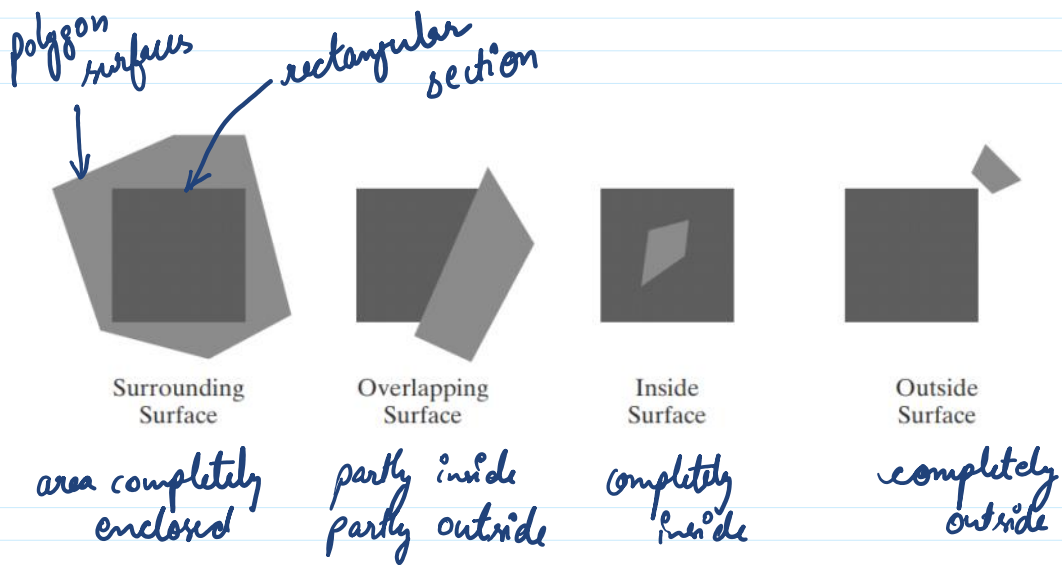
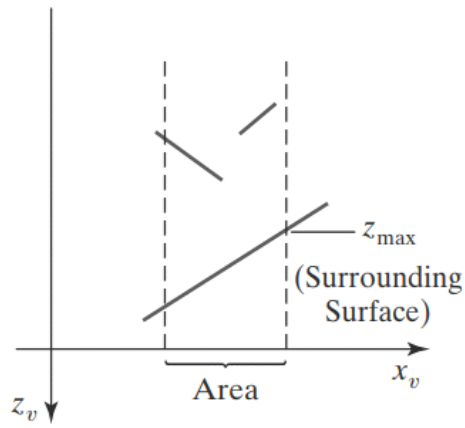


Figure 13-20  
Dividing a square area into equal-sized quadrants at each step.



No further subdivisions of a specified area are needed if

- ① An area has no inside, overlapping, or surrounding surfaces.
- ② An area has only one inside, overlapping or surrounding surface.
- ③ An area has one surrounding surface that obscures all other surfaces within the area boundaries.



**FIGURE 22**

Within a specified area, a surrounding surface with a maximum depth of  $z_{\max}$  obscures all surfaces that have a minimum depth beyond  $z_{\max}$ .