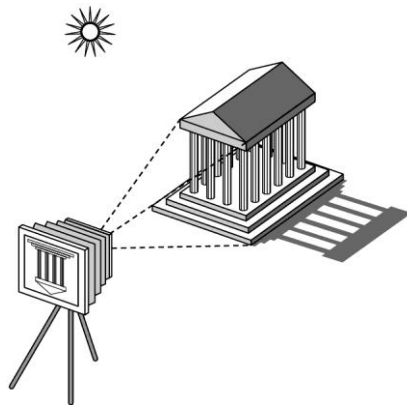


# IMAGES AND IMAGING SYSTEMS

## 1.3 Images: Physical and synthetic

Elements of image formation:

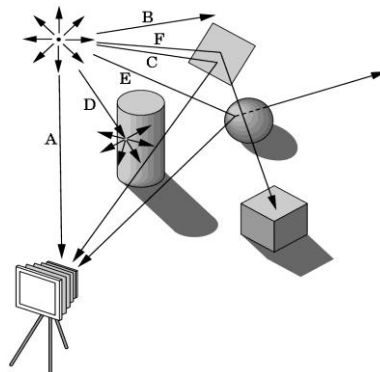
- Objects
- Viewer
- Light source (s)



### Image formation models

Ray tracing :

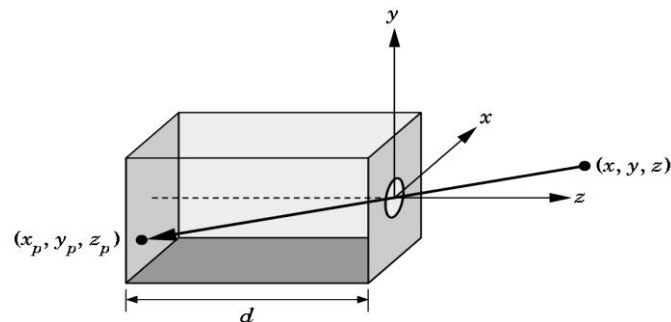
One way to form an image is to follow rays of light from a point source finding which rays enter the lens of the camera. However, each ray of light may have multiple interactions with objects before being absorbed or going to infinity.



## 1.4 Imaging systems

It is important to study the methods of image formation in the real world so that this could be utilized in image formation in the graphics systems as well.

1. Pinhole camera:

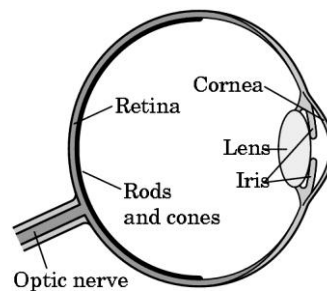


Use trigonometry to find projection of point at  $(x,y,z)$

$$xp = -x/z/d \quad yp = -y/z/d \quad zp = d$$

These are equations of simple perspective

2. Human visual system



- Rods are used for : monochromatic, night vision
- Cones
  - Color sensitive
  - Three types of cones
  - Only three values (the *tristimulus* values) are sent to the brain
- Need only match these three values
  - Need only three *primary* colors