

Geometry of Image Formation

Pin hole camera: $x = \frac{-fX}{Z}, y = \frac{-fY}{Z}$

Projection of lines $\mathbf{X} = \mathbf{A} + \lambda \mathbf{D}$: $\lim_{\lambda \rightarrow \infty} \mathbf{p} = f \frac{\mathbf{A} + \lambda \mathbf{D}}{A_Z + \lambda D_Z} = f \frac{\mathbf{D}}{D_Z}$

Projection of planes: $\mathbf{X} \cdot \mathbf{N} = d$:
 $\lim_{Z \rightarrow \infty} \mathbf{p} \cdot \mathbf{N} = 0 \Rightarrow xN_x + yN_y + fN_z = 0$