



Screen coordinates \Rightarrow NDC $2 \times 2 \times 2$ cube
 $winW$ is the width of window in pixel
 $winH$ is the height of window in pixel
 $curX$ is the cursor on X-axis in pixel
 $curY$ is the cursor on Y-axis in pixel
Field Of View(FOV) = β

$$gX = \frac{curX}{x'} - \frac{ndcW}{2}$$

$$\frac{ndcW}{2} = \tan \beta$$

$$x' = \frac{winW}{ndcW}$$

$$x' = \frac{winW}{2 \tan \beta}$$

$$gX = \frac{curX}{winW} 2 \tan \beta - \tan \beta$$

$$gX = \tan \beta \left(\frac{curX}{\frac{winW}{2}} - 1 \right)$$

$$gY = - \left(\frac{curY}{x'} - \frac{ndcH}{2} \right)$$

$$\frac{ndcH}{2} = \tan \beta$$

$$x' = \frac{winH}{ndcH}$$

$$x' = \frac{winH}{2 \tan \beta}$$

$$gY = - \left(\frac{curY}{winH} 2 \tan \beta - \tan \beta \right)$$

$$gY = - \tan \beta \left(\frac{curY}{\frac{winH}{2}} - 1 \right)$$