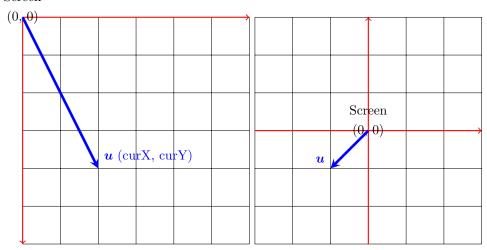
Screen



Screen coordinates \Rightarrow NDC $2 \times 2 \times 2$ cube winW is the width of window in pixel winH is the heigh 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

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

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

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

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

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

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

$$\begin{split} gY &= -\left(\frac{curY}{x'} - \frac{ndcH}{2}\right) \\ \frac{ndcH}{2} &= \tan\beta \\ x' &= \frac{winH}{ndcH} \\ x' &= \frac{winH}{2\tan\beta} \\ gY &= -\left(\frac{curY}{winH} 2\tan\beta - \tan\beta\right) \\ gY &= -\tan\beta \left(\frac{curY}{\frac{winH}{2}} - 1\right) \end{split}$$