Input:
- camera opening angle (FOV)
- width, height of the image
(α, ω, h)

Field of view (FOV)

$i \in \{0, \dots \omega-1\}$
$j \in \{0, \dots h-1\}$

$$\frac{\frac{\omega S}{2}}{1} = tg \frac{\alpha}{2}$$

$$\Updownarrow$$

$$S = \frac{2 tg \frac{\alpha}{2}}{\omega}$$
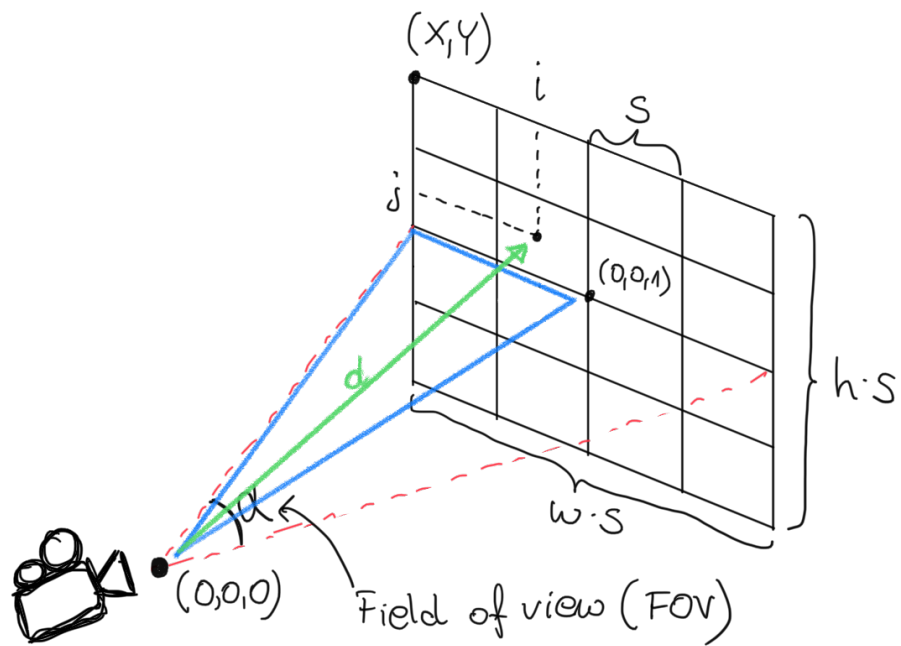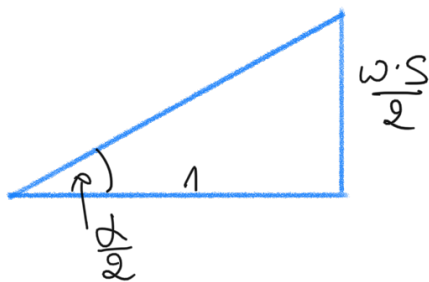
$$X = \frac{-\omega S}{2}$$

$$Y = \frac{h S}{2}$$

Computing per-pixel direction d

w, h - width and height of the image in pixels
(X, Y) - top-left corner of the image plane $(Z = 1)$

For $i = 0$ to $w - 1$

    For $j = 0$ to $h - 1$

        $dx = X + i \cdot s + 0.5s$

        $dy = Y - j \cdot s - 0.5s$

        $dz = 1$

        $d = d / \|d\|$

    End

  End