$\vec{O}$: origin

$\vec{p}$: point on the screen

$\vec{v}$: unit ray vector

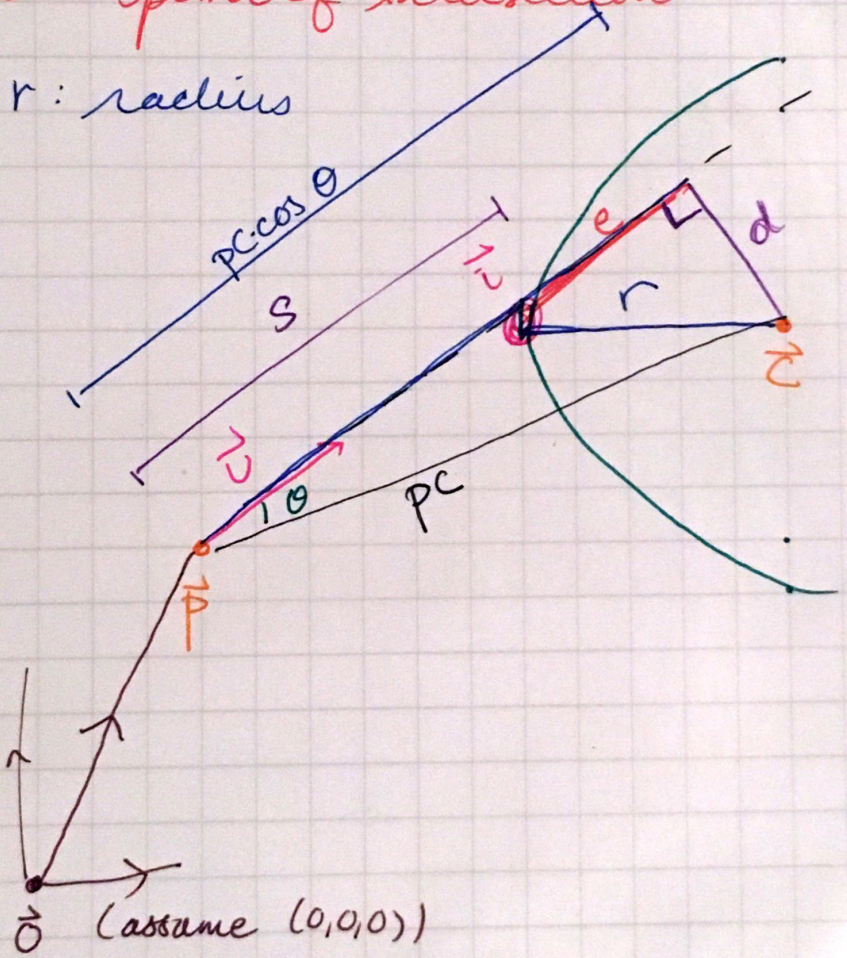
θ : angle between $\vec{pc} = (\vec{c} - \vec{p})$ and $\vec{v}$

pc : $\|\vec{c} - \vec{p}\|$

s : length such that $\vec{p} + s\vec{v} = \vec{c}$

$\vec{c}$: point of intersection

r : radius



Algorithm:

① $\dfrac{\vec{v} \cdot \vec{pc}}{\|\vec{pc}\|} = \cos\theta$

② $\theta = \arccos(\cos\theta)$

③ $d = \sin\theta \cdot \|\vec{pc}\|$

④ $e = \sqrt{r^2 - d^2}$

⑤ $s = pc\cos\theta - e$

⑥ $\boxed{\vec{p} + s\vec{v} = \vec{c}}$