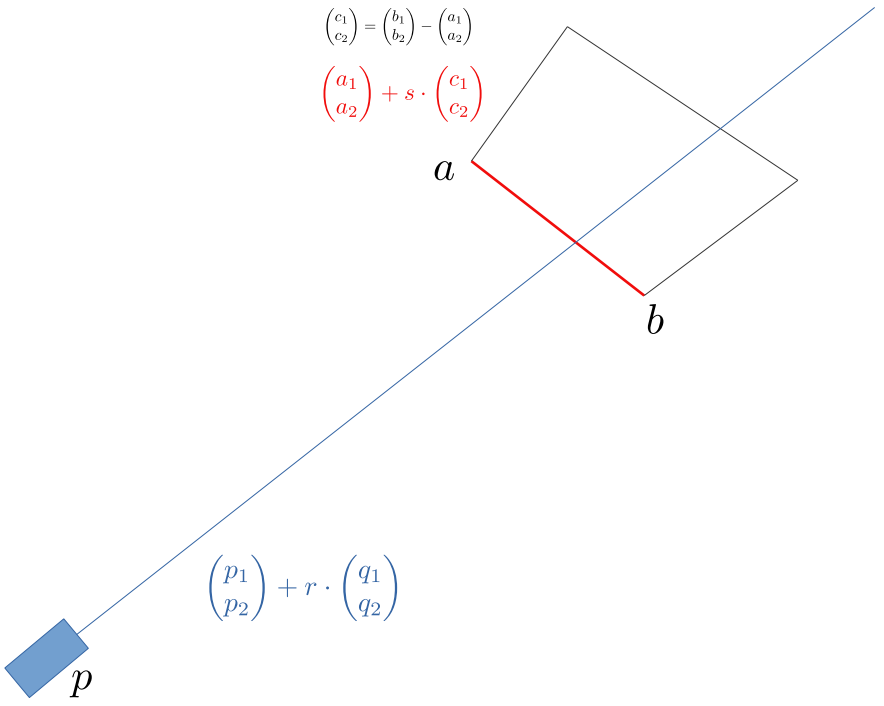
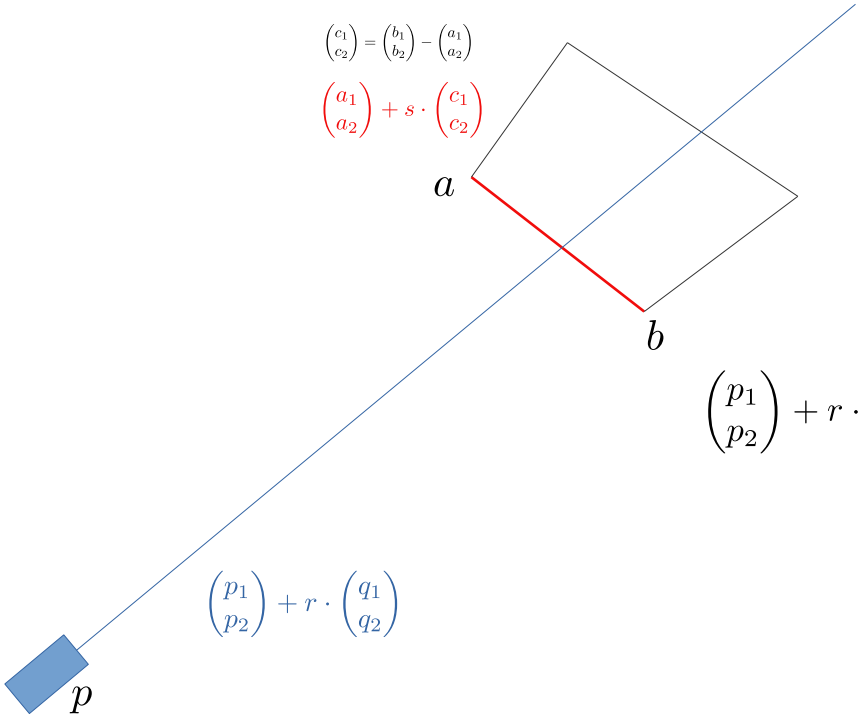
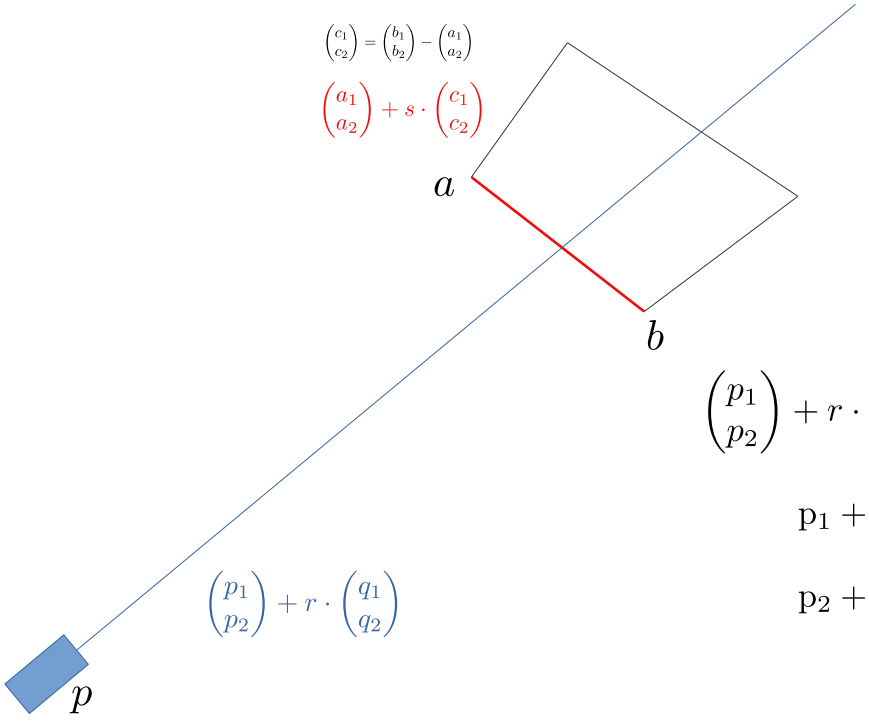

$\begin{pmatrix} c_1 \\ c_2 \end{pmatrix} = \begin{pmatrix} b_1 \\ b_2 \end{pmatrix} - \begin{pmatrix} a_1 \\ a_2 \end{pmatrix}$
$\begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + s \cdot \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$
a
b
$\begin{pmatrix} p_1 \\ p_2 \end{pmatrix} + r \cdot \begin{pmatrix} q_1 \\ q_2 \end{pmatrix}$
p



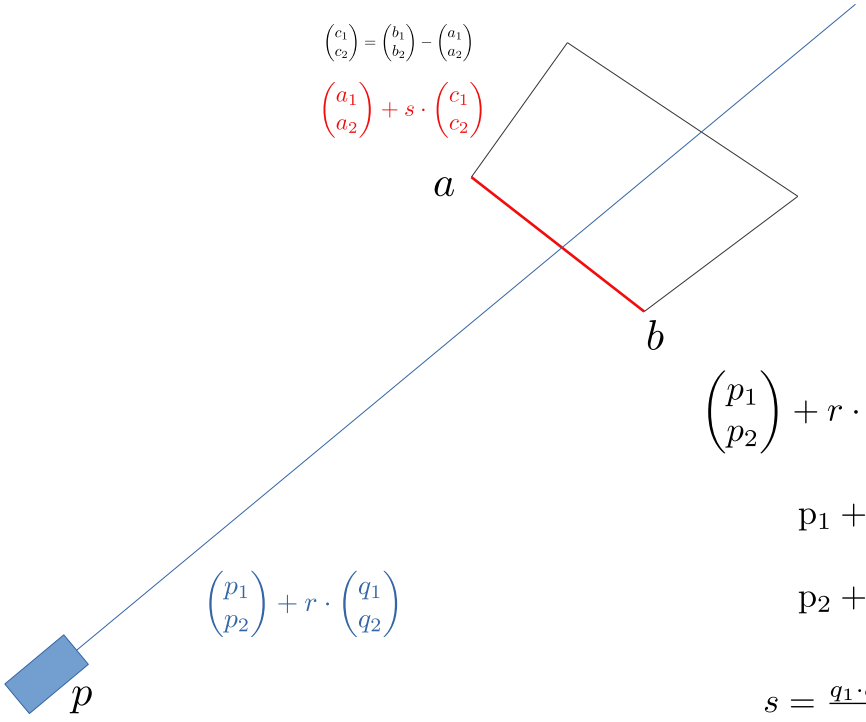
$$\begin{pmatrix} p_1 \\ p_2 \end{pmatrix} + r \cdot \begin{pmatrix} q_1 \\ q_2 \end{pmatrix} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + s \cdot \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$$



$$\begin{pmatrix} p_1 \\ p_2 \end{pmatrix} + r \cdot \begin{pmatrix} q_1 \\ q_2 \end{pmatrix} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + s \cdot \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$$

$$\mathrm{p}_1 + r \cdot q_1 = a_1 + s \cdot c_1$$

$$\mathrm{p}_2 + r \cdot q_2 = a_2 + s \cdot c_2$$

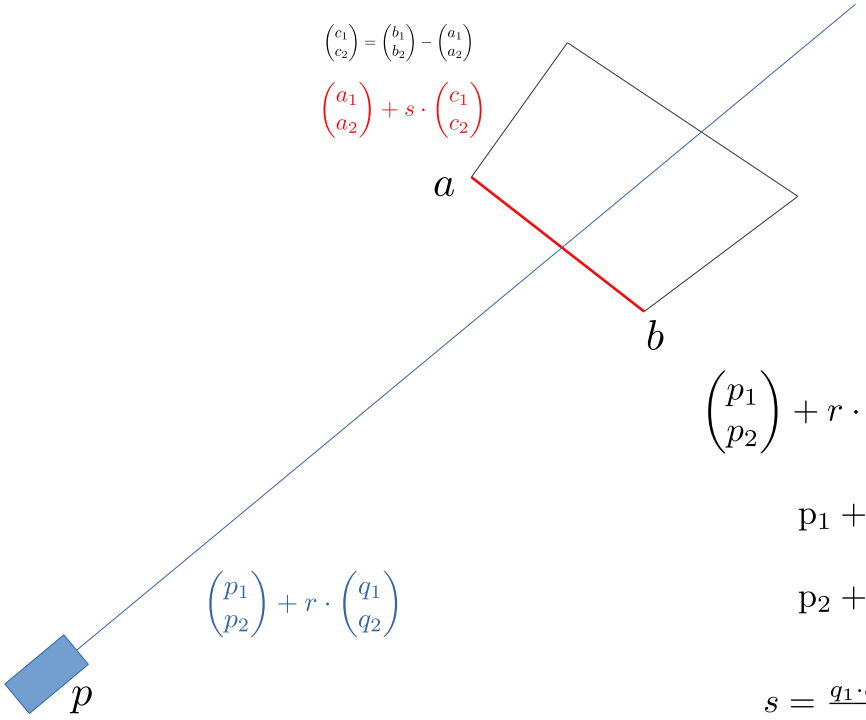


$$\begin{pmatrix} p_1 \\ p_2 \end{pmatrix} + r \cdot \begin{pmatrix} q_1 \\ q_2 \end{pmatrix} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + s \cdot \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$$

$$\mathrm{p}_1 + r \cdot q_1 = a_1 + s \cdot c_1$$

$$\mathrm{p}_2 + r \cdot q_2 = a_2 + s \cdot c_2$$

$$s = \frac{q_1 \cdot a_2 - q_2 \cdot a_1 + p_1 \cdot q_2 - p_2 \cdot q_1}{c_1 \cdot q_2 - c_2 \cdot q_1}$$



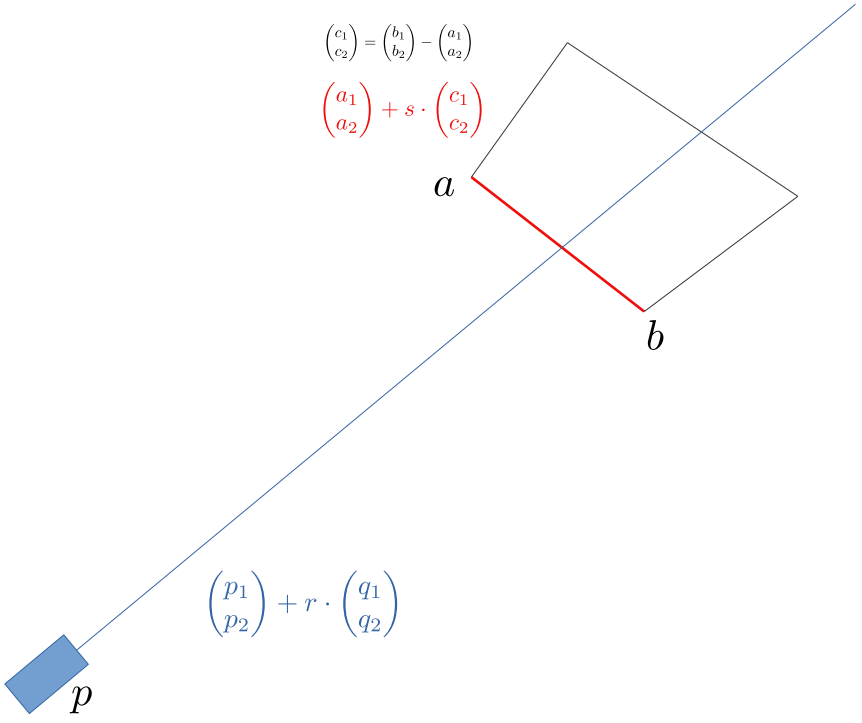
$$\begin{pmatrix} p_1 \\ p_2 \end{pmatrix} + r \cdot \begin{pmatrix} q_1 \\ q_2 \end{pmatrix} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + s \cdot \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$$

$$\mathrm{p}_1 + r \cdot q_1 = a_1 + s \cdot c_1$$

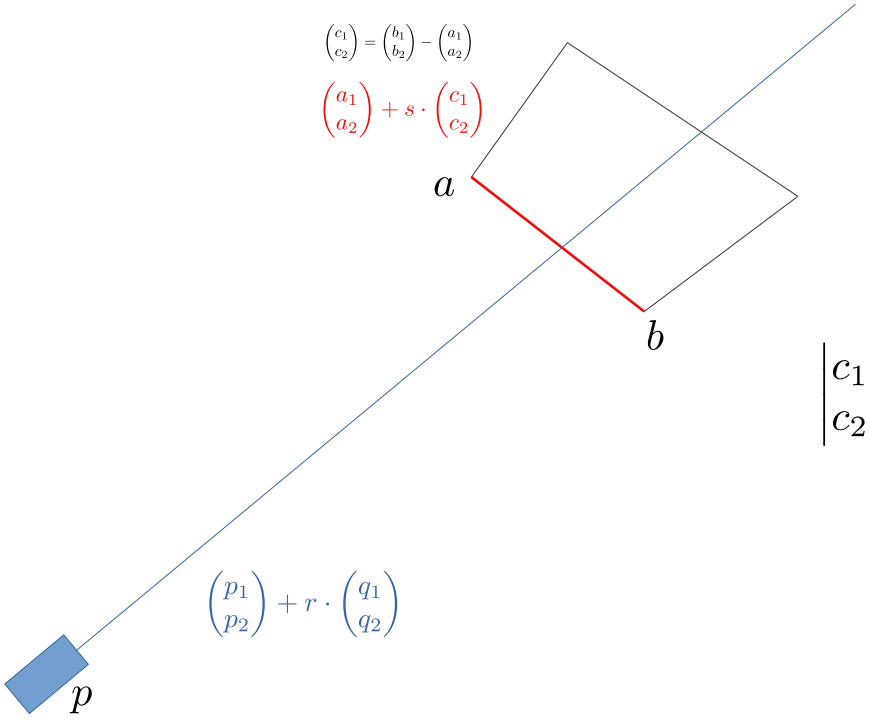
$$\mathrm{p}_2 + r \cdot q_2 = a_2 + s \cdot c_2$$

$$s = \frac{q_1 \cdot a_2 - q_2 \cdot a_1 + p_1 \cdot q_2 - p_2 \cdot q_1}{c_1 \cdot q_2 - c_2 \cdot q_1}$$

$$s = \frac{\begin{vmatrix} q_1 & a_1 \\ q_2 & a_2 \end{vmatrix} + \begin{vmatrix} p_1 & q_1 \\ p_2 & q_2 \end{vmatrix}}{\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix}}$$

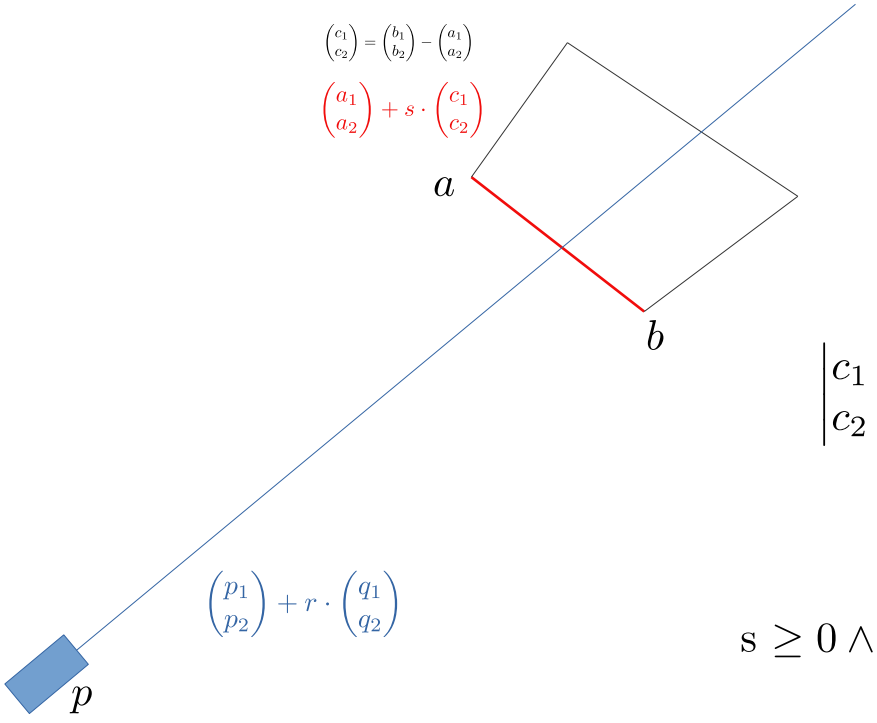


$$s = \frac{\begin{vmatrix} q_1 & a_1 \\ q_2 & a_2 \end{vmatrix} + \begin{vmatrix} p_1 & q_1 \\ p_2 & q_2 \end{vmatrix}}{\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix}}$$



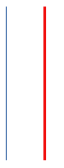
$$s = \frac{\begin{vmatrix} q_1 & a_1 \\ q_2 & a_2 \end{vmatrix} + \begin{vmatrix} p_1 & q_1 \\ p_2 & q_2 \end{vmatrix}}{\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix}}$$

$$\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix} = 0 \Rightarrow$$

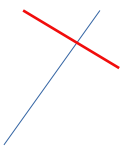


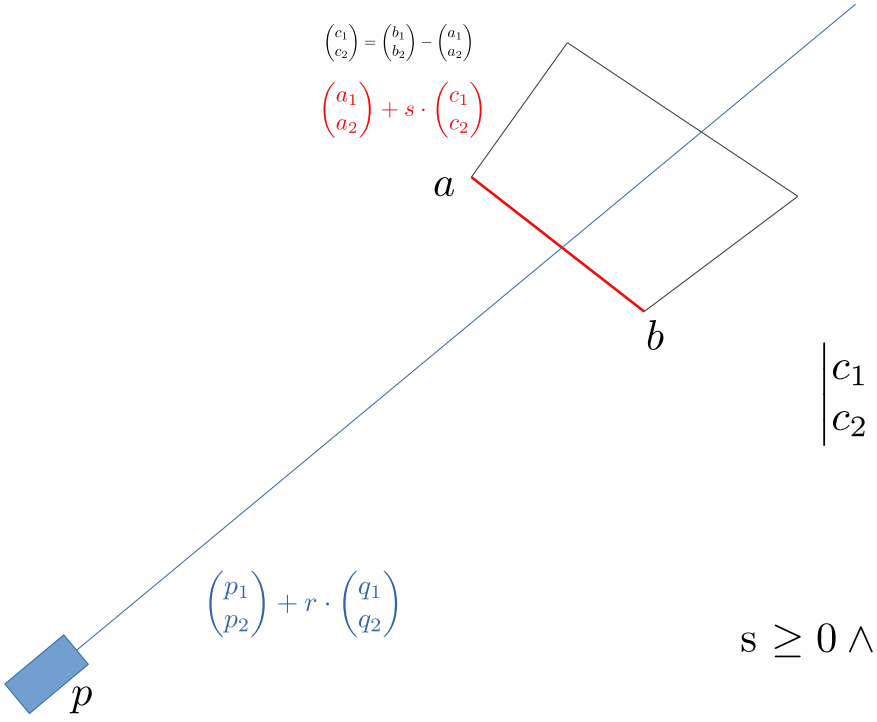
$$s = \frac{\begin{vmatrix} q_1 & a_1 \\ q_2 & a_2 \end{vmatrix} + \begin{vmatrix} p_1 & q_1 \\ p_2 & q_2 \end{vmatrix}}{\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix}}$$

$$\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix} = 0 \Rightarrow$$



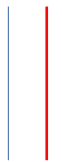
$$\mathrm{s} \geq 0 \wedge s \leq 1 \Rightarrow$$



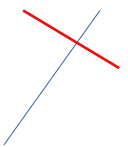


$$s = \frac{\begin{vmatrix} q_1 & a_1 \\ q_2 & a_2 \end{vmatrix} + \begin{vmatrix} p_1 & q_1 \\ p_2 & q_2 \end{vmatrix}}{\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix}}$$

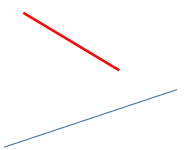
$$\begin{vmatrix} c_1 & q_1 \\ c_2 & q_2 \end{vmatrix} = 0 \Rightarrow$$

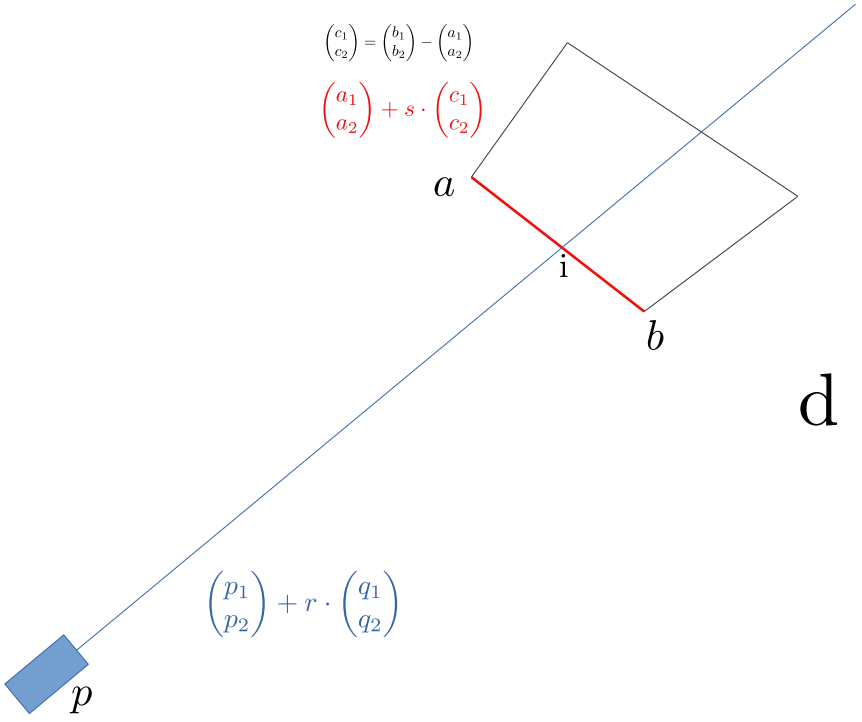


$$\mathrm{s} \geq 0 \wedge s \leq 1 \Rightarrow$$



$$\mathrm{s} < 0 \vee s > 1 \Rightarrow$$

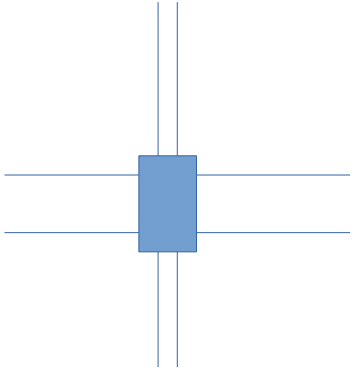



$\begin{pmatrix} c_1 \\ c_2 \end{pmatrix} = \begin{pmatrix} b_1 \\ b_2 \end{pmatrix} - \begin{pmatrix} a_1 \\ a_2 \end{pmatrix}$
$\begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + s \cdot \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$
a
i
b
$\begin{pmatrix} p_1 \\ p_2 \end{pmatrix} + r \cdot \begin{pmatrix} q_1 \\ q_2 \end{pmatrix}$
p

$$\mathrm{d} = |i - p|$$

Next Steps

Sensors for each direction



Distance to other vehicles