$$\vec{a} = \overrightarrow{OA} + t_1 \cdot \vec{d_1}$$

$$\vec{b} = \overrightarrow{OB} + t_2 \cdot \vec{d_2}$$

$$\begin{pmatrix} i_x \\ i_y \end{pmatrix} = \begin{pmatrix} a_x \\ a_y \end{pmatrix} + \begin{pmatrix} d_{1x} \\ d_{1y} \end{pmatrix} \cdot u$$

$$\begin{pmatrix} i_x \\ i_y \end{pmatrix} = \begin{pmatrix} b_x \\ b_y \end{pmatrix} + \begin{pmatrix} d_{2x} \\ d_{2y} \end{pmatrix} \cdot v$$

replace vector $\vec{a}$ and $\vec{b}$ with coordinates

$$a_x + d_{1x} \cdot u = b_x + d_{2x} \cdot v$$

$$(a_y + d_{1y}) \cdot u = (b_y + d_{2y}) \cdot v$$

$$x_{11} + d_{1x} \cdot u = x_{21} + d_{2x} \cdot v \quad \text{(I)}$$

$$y_{11} + d_{1y} \cdot u = y_{21} + d_{2y} \cdot v \quad \text{(II)}$$

$$\text{(I)} \quad | - x_{21} \; | : d_{2x}$$

solve the first equation for $v$

$$\text{(I)} \quad \frac{((x_{11} + d_{1x} \cdot u) - x_{21})}{d_{2x}} = v$$

(II) solve the second equation for $u$ und insert the ~~right~~ left side of I for $v$

$$y_{11} + d_{1y} \cdot u = y_{21} + d_{2y} \cdot v$$

$$y_{11} + d_{1y} \cdot u = y_{21} + d_{2y} \cdot \frac{((x_{11} + d_{1x} \cdot u) - x_{21})}{d_{2x}} \quad | \cdot d_{2x}$$

$$y_{11} + d_{1y} \cdot u \cdot d_{2x} = y_{21} + d_{2y} - x_{21} \cdot (x_{11} + d_{1x}) \cdot u$$

$$u = \frac{y_{21} + d_{22} - y_{11}}{d_{1y} \cdot d_{2x} + x_{21} + x_{11} + x_{21} \cdot d_{1x}}$$