RANSAC Practice

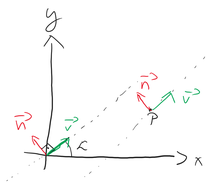
line implicit

$a \cdot x + b \cdot y + c = 0$

line parametric

$\underset{\text{point on line}}{p} + t \cdot \underset{\text{line direction}}{\vec{v}} \quad t \in \mathbb{R}$

divide by $\sqrt{a^2+b^2}$



$\vec{v} = \begin{bmatrix} \cos\alpha \\ \sin\alpha \end{bmatrix} = \begin{bmatrix} v_x \\ v_y \end{bmatrix}$

$\vec{n} = \begin{bmatrix} -v_y \\ v_x \end{bmatrix}$

rotate 90°

implicit $\longleftrightarrow$ parametric

$n_x \cdot x + n_y \cdot y + c' = 0 \longleftrightarrow p + t \cdot \vec{v}$

Line fit

implicit coeffs.

$$\begin{bmatrix} x_i & y_i & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} = 0$$

$$A \cdot x = 0$$

↳ solution: eig. of $A^T A$

Random from [a, b]

Uniform distr. $[0, 1]$ $\cdot (b-a)$

$[0, b-a]$ $+a$

$[a, b]$

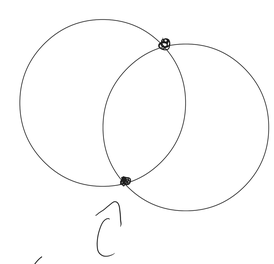
RANSAC for circles

for Math see canvas

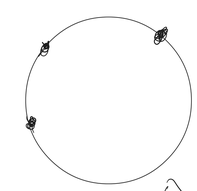
Solution for

$(A^T A)^{-1} A^T \cdot / \; A x = b$ → cv::inv() / cv::solve()

$$x = (A^T A)^{-1} A^T b$$



two points not enough for circle



3 points min. for circle