Probabilistic Robotics Lab 2
Prelab

Rodrigo Caye Daudt

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1 Line parameters from points

Given $P_1 = (x_1, y_1)$ and $P_2 = (x_2, y_2)$, we can calculate the coefficients a, b, and c of the equation

$$ax + by + c = 0$$

that describes the line that passes through P_1 and P_2 using Eqs. 1, 2, and 3.

$$a = y_1 - y_2 \tag{1}$$

$$b = x_2 - x_1 \tag{2}$$

$$c = x_1 y_2 - x_2 y_1 \tag{3}$$

2 Distance between point and line

Given a line defined by

$$ax + by + c = 0$$

and a point $P_0 = (x_0, y_0)$, the minimum distance between the point and the line is given by Eq. 4.

$$distance = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}} \tag{4}$$