

Pole 1 X, Y $x_1 := 2$ $y_1 := 2$ measured Range 1 $r_1 := 1$

Pole 2 X, Y $x_2 := 2.5$ $y_2 := 1.5$ measured Range 2 $r_2 := 1$

Guess (you expect to be here) -> $p := 2$ $q := 1$ = coords of update way point.
expected coords of update way point

STEP 1 - Find coordinates of sensor >

Given $r_1^2 = (x_1 - p)^2 + (y_1 - q)^2$ $r_2^2 = (x_2 - p)^2 + (y_2 - q)^2$

answer := Find(p, q)

answer = $\begin{pmatrix} 1.589 \\ 1.089 \end{pmatrix}$

scipy.optimize

X answer 0
Y answer 1

STEP 2 - Find bearing of chassis >

step 2a - bearing of marker 1 relative to sensor position

bearing₁ := atan $\left[\frac{(y_1 - \text{answer}_1)}{(\text{answer}_0 - x_1)} \right]$

bearing₁ = -65.705 deg

step 2b - add measured angle of pole relative to chassis heading. = Radar 1 sensor
 This could be repeated with the measured angle of the second pole and averaged.

$\theta_{\text{radar1}} := -20 \text{ deg}$

$\theta_{\text{chassis}} := \text{bearing}_1 - \theta_{\text{radar1}}$

$\theta_{\text{chassis}} = -45.705 \text{ deg}$

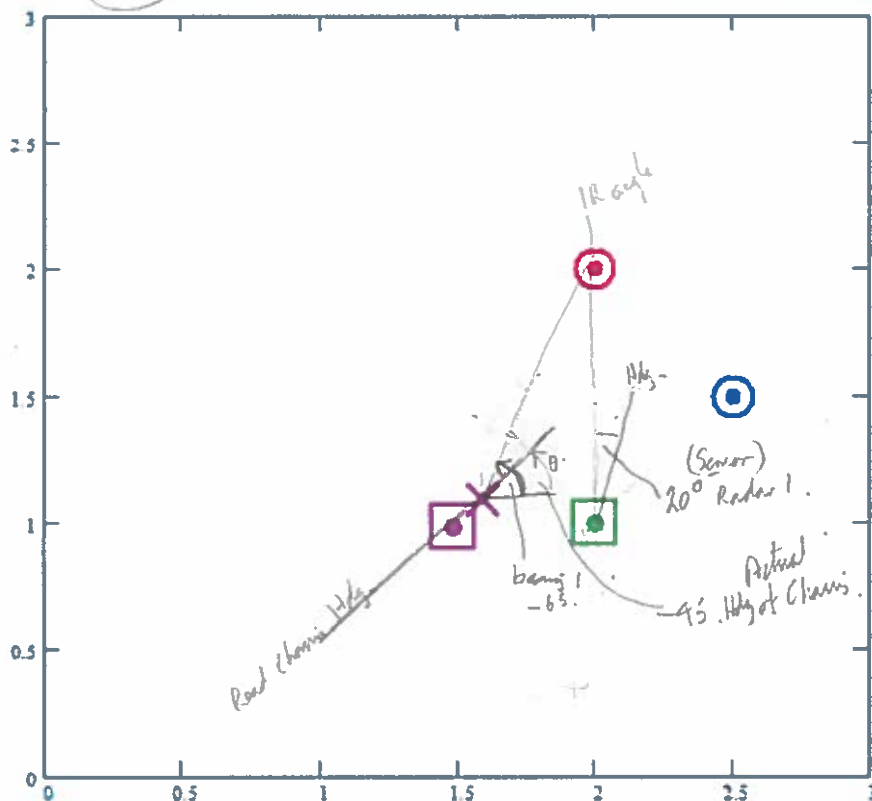
STEP 3 - Find coordinates of middle of chassis (0.15m behind sensor say) >





$a := \text{answer}_0 - 0.15 \cos(-\theta_{\text{chassis}})$

$a = 1.434$

$b := \text{answer}_1 - 0.15 \sin(-\theta_{\text{chassis}})$

$b = 0.981$



-  pole 1
-  pole 2
-  GUESS
-  sensor chassis

