Cinemática de Robots.

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Practica 2.

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(-7,-7), (2,-9), (-8,-3)

(-7,-7)

$$q2\ atm\left(\frac{-7^2+-7^2-30^2-20^2}{20(30)(20)}\right)$$

$$=\ -1.001\quad q2 = atam\ (-1.001)\ \ q2 =\ -45.04$$

$$q1 = atan\left(\frac{8}{2}\right) - atam\left(\frac{20\ sen\ (-45.04)}{30+20\cos(-45.735}\right) = \frac{-14.45}{44.13}$$

$$q1 = \text{atan}(4) - \text{atan}(-0.327) = 94.07$$

(2,-9)

$$q2 = \text{atan}\left(\frac{2^2+(-9^2)-30^2-20^2}{2(30)(20)}\right)$$

$$=\ -1.00125\quad q2 = atam\ (-1.00125)\ \ q2 =\ -45.35$$

$$q2 = \text{atan}\frac{8}{2} - atan\left(\frac{20\ sen\ (-45.35)}{30+20\cos(-45.35)}\right) = \frac{-14.22}{44.05} = 0.3228$$

$$q1 = \text{atan}(4) - \text{atan}(0.3228) = 58.07$$

(-8,-3)

$$q2 = \text{atan}\left(\frac{-8^2+(-3^2)-30^2-20^2}{2(30)(20)}\right) =\ -1.144$$

$$=\ -1.00141\quad q2 = atam\ (-1.00125)\ \ q2 =\ -48.84$$

$$q2 = \text{atan}\frac{8}{2} - atan\left(\frac{20\ sen\ (-48.85)}{30+20\cos(-48.85)}\right) = \frac{-15.05}{43.16} = 0.3489$$

$$q1 = \text{atan}(4) - \text{atan}(0.3428) = 56.76$$

SEGUNDA PARTE:

$$\begin{bmatrix} -L_1\ Sen(q_1) & -L_2\ Sen(q_1+q_2) \\ -L_1\ Cos(q_1) & -L_1\ Cos(q_1+q_2) \end{bmatrix} \begin{bmatrix} -L_2 Sen(q_1+q_2) \\ -L_2 Cos(q_1+q_2) \end{bmatrix}$$

(-7,-7) $q1 = 94.07$ $q2 = -45.04$

$$\begin{bmatrix} -30\ Sen(94.07\ ) & -L_2\ Sen(94.07\ +(-45.04)) \\ -30\ Cos(94.07\ ) & -L_1\ Cos(94.07\ +(-45.04)) \end{bmatrix} \begin{bmatrix} -20Sen(94.07\ +(-45.04)) \\ -20Cos(94.07\ +(-45.04)) \end{bmatrix}$$

(2,-9) $q1 = 58.07$ $q2 = -45.35$

$$\begin{bmatrix} -30\ Sen(58.07) & -L_2\ Sen(58.07\ +(-45.35)) \\ -30\ Cos(58.07\ ) & -L_1\ Cos(58.07\ +(-45.35)) \end{bmatrix} \begin{bmatrix} -20Sen(58.07\ +(-45.35)) \\ -20Cos(58.07\ +(-45.35)) \end{bmatrix}$$

(-8,-3) $q1 = 56.72$ $q2 = -48.84$

$$\begin{bmatrix} -30\ Sen(56.72) & -L_2\ Sen(56.72+(-48.84)) \\ -30\ Cos(56.72) & -L_1\ Cos(56.72+(-48.84)) \end{bmatrix} \begin{bmatrix} -20Sen(56.72\ +(-48.84)) \\ -20Cos(56.72\ +(-48.84)) \end{bmatrix}$$

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Práctica # 2

(1) (-1, 7), (2, -9), (-8, -3)

(-7, 7)

$q_2 = \mathrm{atan}\left(\frac{(-7)^2 + (-7)^2 - (30)^2 - (20)^2}{2(30)(20)}\right)$

$= -1.001 \quad q_2 = \mathrm{atan}(-1.001) \quad q_2 = -45.09$

$q_1 = \mathrm{atan}\left(\frac{y}{x}\right) - \mathrm{atan}\left(\frac{20\,\mathrm{sen}(-45.09)}{30 + 20\cos(-45.09)}\right) = \frac{-14.45}{44.13}$

$q_1 = \mathrm{atan}(1) - \mathrm{atan}(-0.327) = 99.07$

(2, -9)

$q_2 = \mathrm{atan}\left(\frac{(2)^2 + (-9)^2 - (30)^2 - (20)^2}{2(30)(20)}\right)$

$= -1.0125 \quad q_2 = \mathrm{atan}(-1.0125) = -45.35$

$q_1 = \mathrm{atan}\left(\frac{y}{x}\right) - \mathrm{atan}\left(\frac{20\,\mathrm{sen}(-45.35)}{30 + 20\cos(-45.35)}\right) = \frac{-14.22}{44.05} = 0.$

$q_1 = \mathrm{atan}(9) - \mathrm{atan}(0.3228) = 58.07$

(-8, -3)

$q_2 = \mathrm{atan}\left(\frac{(-8)^2 + (-3)^2 - (30)^2 - (20)^2}{2(30)(20)}\right) = -1.1491$

$= -1.191 \quad q_2 = \mathrm{atan}(-1.0125) = -48.89$

$q_1 = \mathrm{atan}(8/2) - \mathrm{atan}\left(\frac{20\,\mathrm{Sen}(-48.89)}{20 + 20\cos(-48.89)}\right) = \frac{-15.05}{43.16} = -0.$

$= \mathrm{atan}(4) - \mathrm{atan}(0.3484) = 56.72$