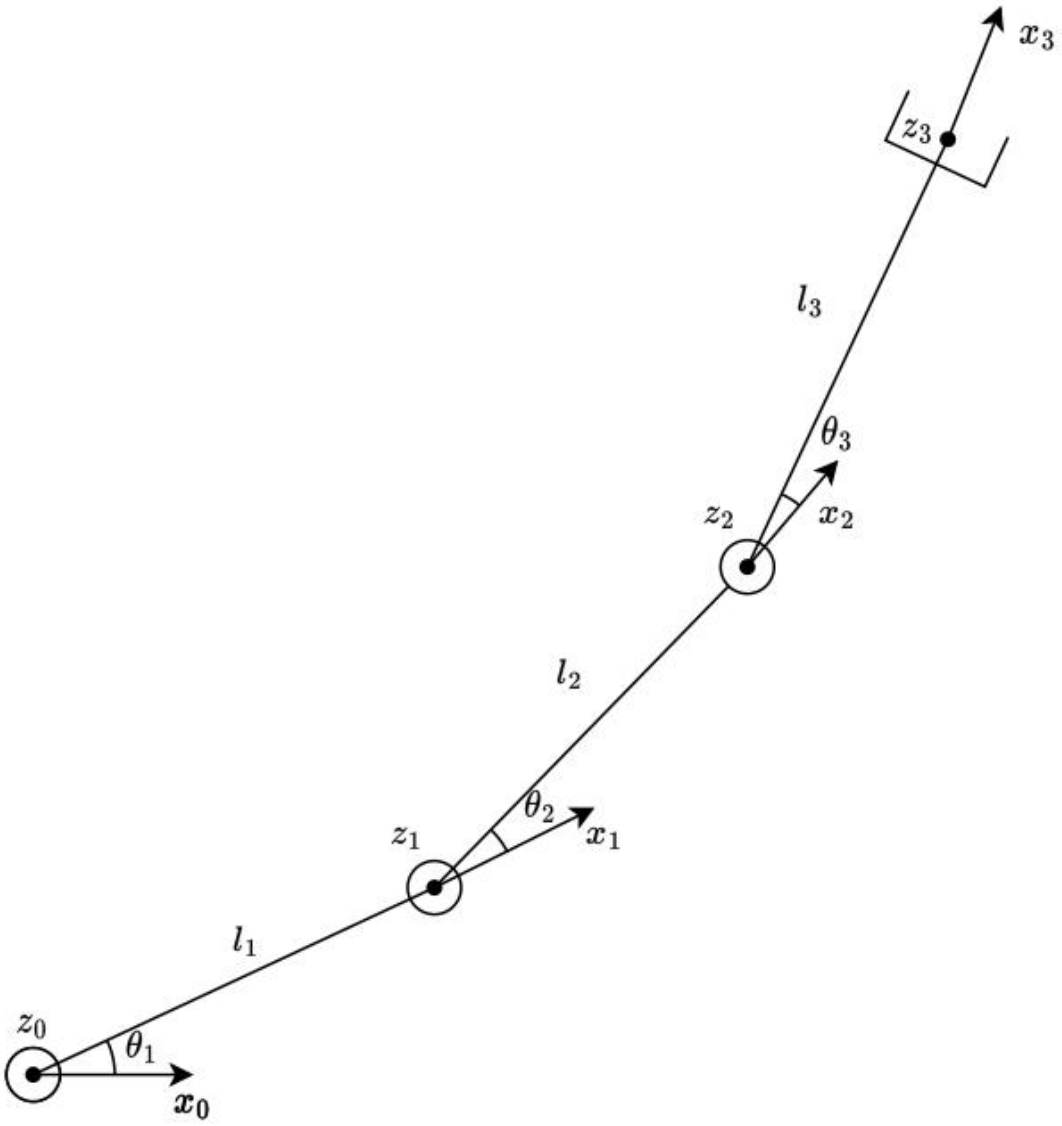
Cinematica diretta robot RRR planare




```
syms q1 q2 q3 l1 l2 l3 real
DHRRRplanare = [l1, 0, 0, q1;
                l2, 0, 0, q2;
                l3, 0, 0, q3]
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DHRRRplanare =

$$\begin{pmatrix} l_1 & 0 & 0 & q_1 \\ l_2 & 0 & 0 & q_2 \\ l_3 & 0 & 0 & q_3 \end{pmatrix}$$

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TRRRplanareList = cinDirDH(DHRRRplanare);
T01 = TRRRplanareList{1}
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T01 =

$$\begin{pmatrix} \cos(q_1) & -\sin(q_1) & 0 & l_1\cos(q_1) \\ \sin(q_1) & \cos(q_1) & 0 & l_1\sin(q_1) \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

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T12 = TRRRplanareList{2}
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T12 =

$$\begin{pmatrix} \cos(q_2) & -\sin(q_2) & 0 & l_2\cos(q_2) \\ \sin(q_2) & \cos(q_2) & 0 & l_2\sin(q_2) \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

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T23 = TRRRplanareList{3}
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T23 =

$$\begin{pmatrix} \cos(q_3) & -\sin(q_3) & 0 & l_3\cos(q_3) \\ \sin(q_3) & \cos(q_3) & 0 & l_3\sin(q_3) \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

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T03 = TRRRplanareList{4}
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T03 =

$$\begin{pmatrix} \sigma_2 & -\sigma_1 & 0 & l_2\cos(q_1+q_2)+l_1\cos(q_1)+l_3\,\sigma_2 \\ \sigma_1 & \sigma_2 & 0 & l_2\sin(q_1+q_2)+l_1\sin(q_1)+l_3\,\sigma_1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

where

$$\sigma_1 = \sin(q_1+q_2+q_3)$$

$$\sigma_2 = \cos(q_1+q_2+q_3)$$