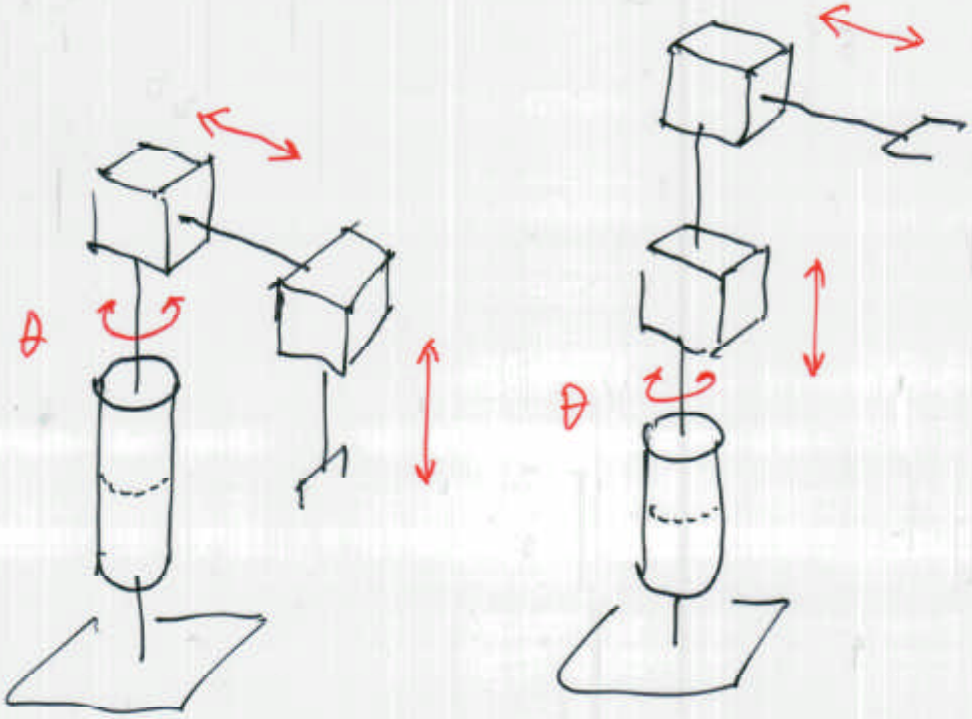
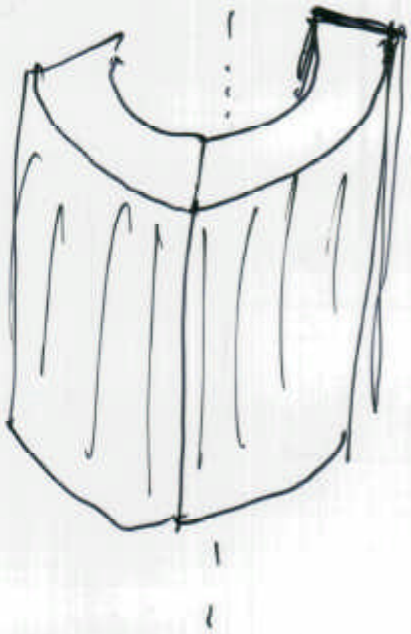
Lezione 26/02/2004
Testo pagg. 12-18 & 75-77

1) Classificazione dei robot
   a) Cartesiani
   b) Cilindrici
   c) Polari
   d) Articolati
   e) SCARA
2) Polso
   a) Euleriano
   b) RPY (roll-pitch-yaw)
3) Cinematica diretta di posizione: sistemi di riferimento
4) Esempio: 1 braccio





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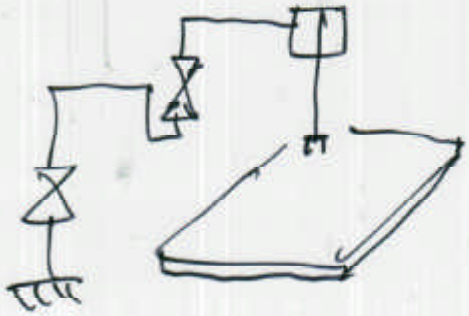
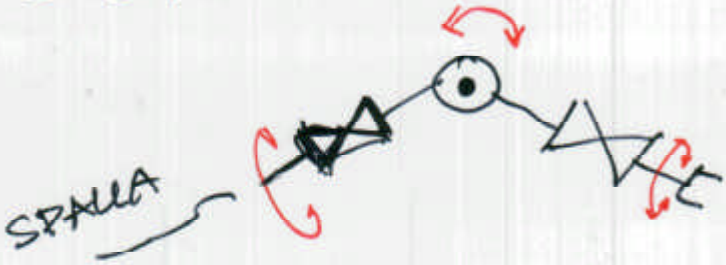
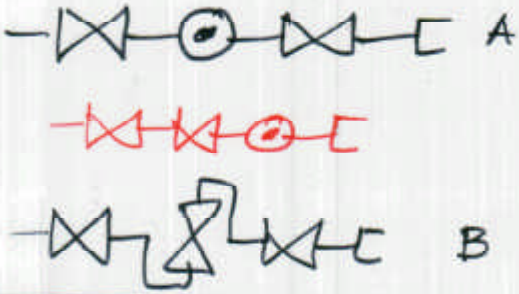


POLSO EULERIANO

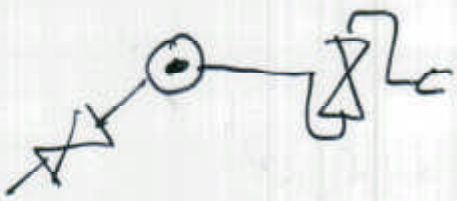
POLSO RPY { ROLL
PITCH
YAW

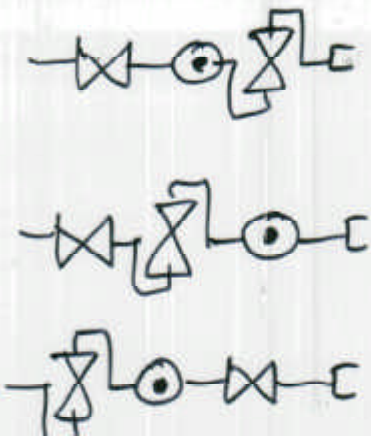
EULERIANO





RPY





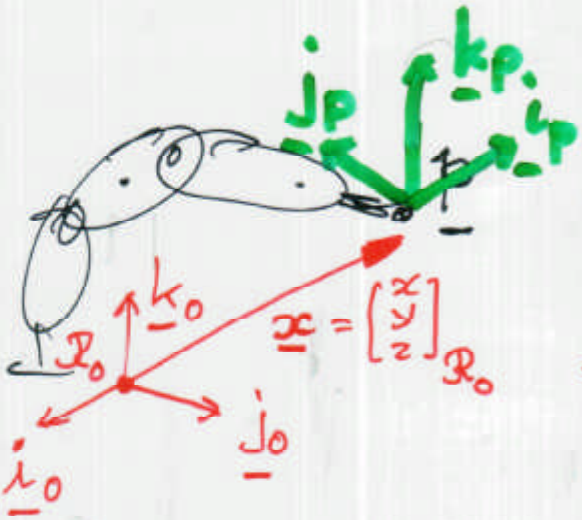
VARIABILI INTERNE → VARIABILI GIUNTO $m\ (=6)$

$$\underline{q} = \begin{bmatrix} q_1 \\ q_2 \\ \vdots \\ q_6 \end{bmatrix}$$

VARIABILI ESTERNE → 3 COOR CARTESIAN. / 3 ANGOLI

$$\underline{p} = \begin{bmatrix} x \\ y \\ z \\ \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{bmatrix} \quad \underline{x}$$

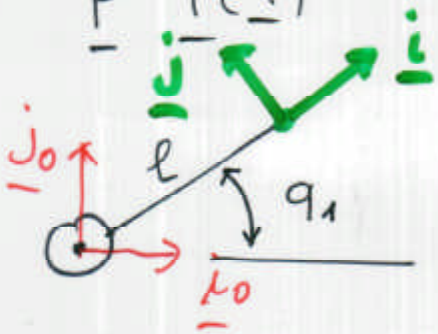
$\underline{p}$ della punta operativa



$$\underline{i}_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} \quad \underline{j}_0 = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} \quad \underline{k}_0 = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$$

FUNZIONI CINEMATICHE (DI POSIZIONE)

DIRETTA $\underline{p} = f(\underline{q})$



$$\underline{p} = \begin{bmatrix} x \\ y \\ \alpha \end{bmatrix} \rightarrow \underline{P} = \begin{pmatrix} x \\ y \\ z \\ \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{pmatrix}$$

$$x = l \cos q_1$$
$$y = l \sin q_1$$
$$\alpha = q_1$$

$$x = l \cos q_1$$
$$y = l \sin q_1$$
$$z = 0$$
$$\alpha_1 = q_1$$
$$\alpha_2 = 0$$
$$\alpha_3 = 0$$

$$\underline{q} = \underline{f}^{-1}(\underline{P})$$

$$\frac{y}{x} = \frac{\sin q_1}{\cos q_1} = \operatorname{tg} q_1$$

$$q_1 = \operatorname{arctg} \frac{y}{x}$$