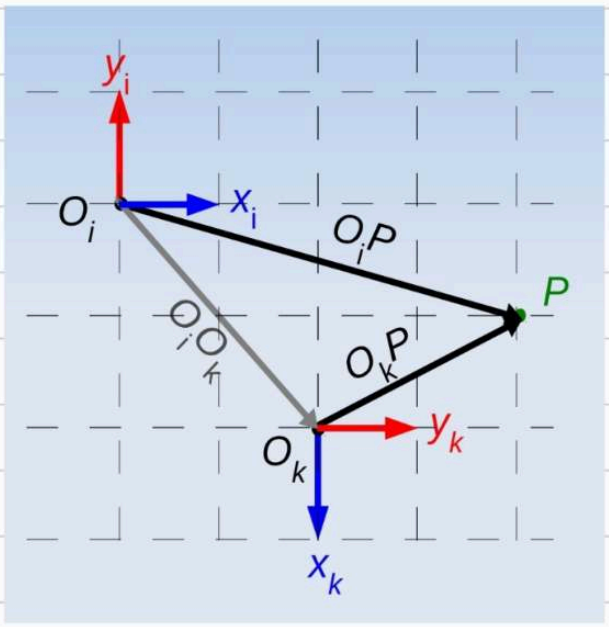
Mouvements, changements de coordonnées

Exercice, calculer ${}^iP = {}^iR_k \cdot {}^kP + {}^iO_k$



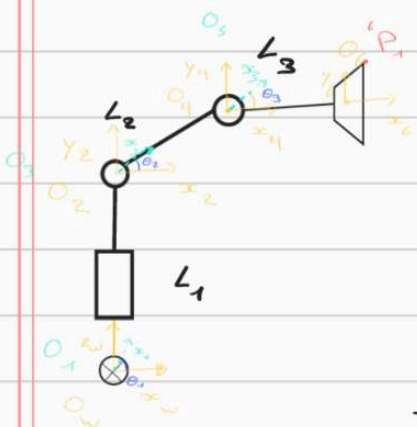
$$ {}^iR_k = \begin{bmatrix} \overset{0}{\cos\theta} & \overset{-1}{-\sin\theta} & 0 \\ \overset{1}{\sin\theta} & \overset{0}{\cos\theta} & 0 \\ 0 & 0 & 1 \end{bmatrix} \qquad \theta = \pi/2 $$

$$ {}^kP = \begin{bmatrix} -1 \\ 2 \\ 0 \\ 1 \end{bmatrix} \qquad {}^iO_k = \begin{bmatrix} 2 \\ -2 \\ 0 \\ 1 \end{bmatrix} $$

$$ \left.\begin{array}{ll} x_k = -y_i & \vec{x}_k = \vec{x}_i\,0 - \vec{y}_i + \vec{z}_i\,0 \\ y_k = x_i & \vec{y}_k = \vec{x}_i + \vec{y}_i\,0 + \vec{z}_i\,0 \\ z_k = z_i & \vec{z}_k = \vec{x}_i\,0 + \vec{y}_i\,0 + \vec{z}_i \end{array}\right\} \text{Permet de trouver } {}^iR_k $$

On a donc

$$ {}^iT_k = \left(\begin{array}{ccc|c} 0 & -1 & 0 & 2 \\ 1 & 0 & 0 & -2 \\ 0 & 0 & 1 & 0 \\ \hline 0 & 0 & 0 & 1 \end{array}\right) $$



On cherche à exprimer les coordonnées de l'effecteur dans le repère monde

$${}^wT_1 = {}^{ROT}/_{z_w}(\theta_1)$$
$${}^1T_2 = TRANS(0,0,L_1)$$
$${}^2T_3 = {}^{ROT}/_{y_2}(\theta_2)$$
$${}^3T_4 = TRANS(0,0,L_2)$$
$${}^4T_5 = {}^{ROT}/_{y_4}(\theta_3)$$
$${}^5T_6 = TRANS(0,0,L_3)$$

Pour trouver les coordonnées de ${}^wP_1$ on a

$$ \begin{bmatrix} {}^wP_1 \\ \hline 1 \end{bmatrix} = {}^wT_6 \begin{bmatrix} {}^6P_1 \\ \hline 1 \end{bmatrix} $$

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Calcul de ${}^{w}T_1 = ROT/z_w(\theta_1)$

$$\begin{pmatrix} \cos\theta_1 & -\sin\theta_1 & 0 \\ \sin\theta_1 & \cos\theta_1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

Calcul de ${}^{2}T_3 = ROT/y_2(\theta_2)$

$$\begin{pmatrix} \cos\theta_2 & 0 & \sin\theta_2 \\ 0 & 1 & 0 \\ -\sin\theta_2 & 0 & \cos\theta_2 \end{pmatrix}$$

Calcul de ${}^{4}T_5 = ROT/y_4(\theta_3)$

$$\begin{pmatrix} \cos\theta_3 & 0 & \sin\theta_3 \\ 0 & 1 & 0 \\ -\sin\theta_3 & 0 & \cos\theta_3 \end{pmatrix}$$

Calcul de ${}^{1}T_2 = TRANS(0,0,\ell)$

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