Homogeneous Transformation Matrix

Saturday, 9 November 2024 7:48 am

$${}^0_3R = {}^0_1R\,{}^1_2R\,{}^2_3R$$

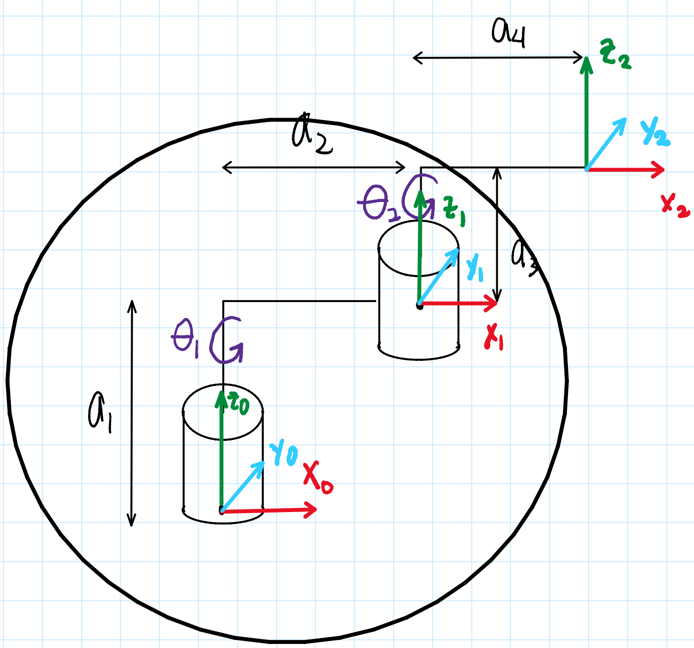
$${}^0_3P \neq {}^0_1P\,{}^1_2P\,{}^2_3P$$

$${}^0_3P \cancel{\neq} {}^0_1P + {}^1_2P + {}^2_3P$$

Denoted as

$${}^{n-1}_{n}H = {}^{n-1}_{n}T$$

$${}^{n-1}_{n}H = \left[\begin{array}{ccc|c} & \overset{[3\times3]}{{}^B_ER} & & \overset{[3\times1]}{{}^B_EP} \\ \hline 0 & 0 & 0 & 1 \end{array}\right]$$



$${}^0_1R = \begin{bmatrix} c\theta_1 & -s\theta_1 & 0 \\ s\theta_1 & c\theta_1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$${}^0_1P = \begin{bmatrix} a_2 c\theta_1 \\ a_2 s\theta_1 \\ a_1 \end{bmatrix}$$

$${}^0_1H = \begin{bmatrix} c\theta_1 & -s\theta_1 & 0 & a_2 c\theta_1 \\ s\theta_1 & c\theta_1 & 0 & a_2 s\theta_1 \\ 0 & 0 & 1 & a_1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$