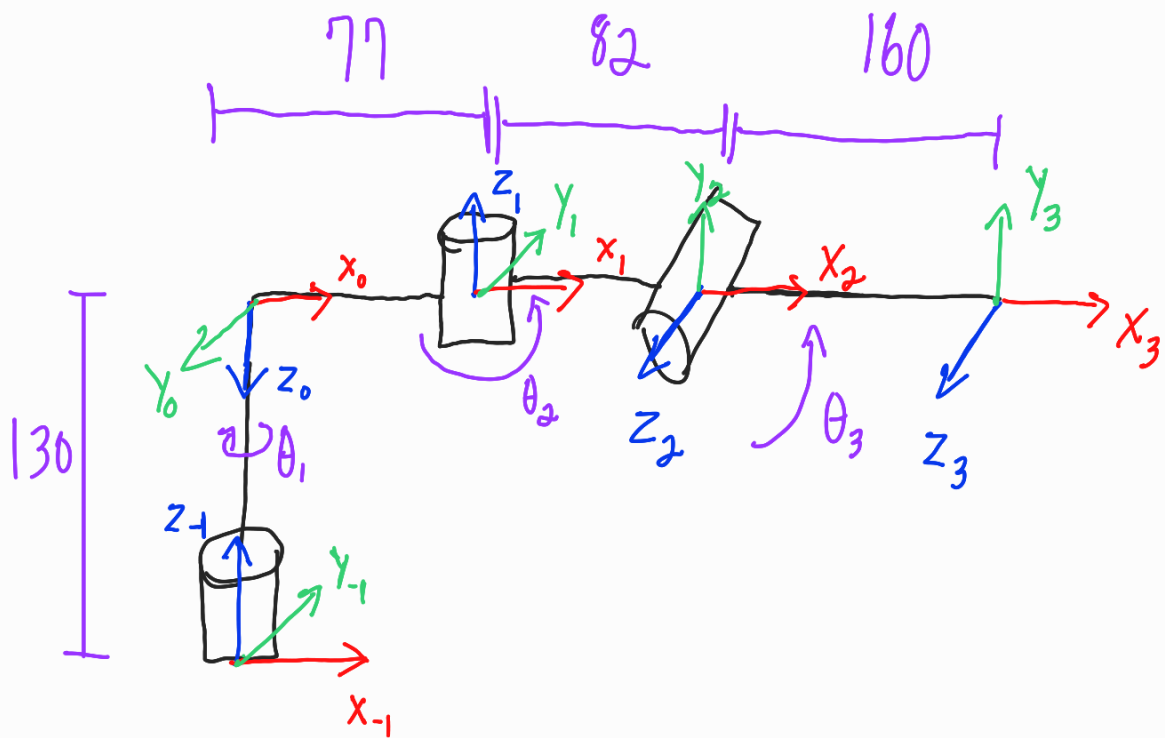


$\hookrightarrow$  medido da mesa!



$i$	$\theta$	$d$	$a$	$\alpha$
0	0	130	0	$180^\circ$
1	$\theta_1^*$	0	77	$180^\circ$
2	$\theta_2^*$	0	82	$90^\circ$
3	$\theta_3^*$	0	160	$0^\circ$

$$A_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$A_1 = \begin{bmatrix} C_1 & S_1 & 0 & 77C_1 \\ S_1 & -C_1 & 0 & 77S_1 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$A_2 = \begin{bmatrix} C_2 & 0 & S_2 & 82C_2 \\ S_2 & 0 & -C_2 & 82S_2 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$A_3 = \begin{bmatrix} C_3 & -S_3 & 0 & 160C_3 \\ S_3 & C_3 & 0 & 160S_3 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$H_1^{-1} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} C_1 & S_1 & 0 & 77C_1 \\ S_1 & -C_1 & 0 & 77S_1 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} =$$

$$H_1^{-1} = \begin{bmatrix} C_1 & S_1 & 0 & 77C_1 \\ -S_1 & C_1 & 0 & -77S_1 \\ 0 & 0 & 1 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$H_2^{-1} = \begin{bmatrix} C_1 & S_1 & 0 & 77C_1 \\ -S_1 & C_1 & 0 & -77S_1 \\ 0 & 0 & 1 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} C_2 & 0 & S_2 & 82C_2 \\ S_2 & 0 & -C_2 & 82S_2 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$H_2^{-1} = \begin{bmatrix} C_1C_2 + S_1S_2 & 0 & C_1S_2 - S_1C_2 & 82C_1C_2 + 82S_1S_2 + 77C_1 \\ -S_1C_2 + C_1S_2 & 0 & -S_1S_2 - C_1C_2 & -82S_1C_2 + 82C_1S_2 - 77S_1 \\ 0 & 1 & 0 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$H_2^{-1} = \begin{bmatrix} C(1-2) & 0 & S_{12} & 82C(1-2) + 77C_1 \\ S_{12} & 0 & -C(1-2) & 82S_{12} - 77S_1 \\ 0 & 1 & 0 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$H_3^{-1} = \begin{bmatrix} C(1-2) & 0 & S_{12} & 82C(1-2) + 77C_1 \\ S_{12} & 0 & -C(1-2) & 82S_{12} - 77S_1 \\ 0 & 1 & 0 & 130 \\ 0 & 0 & 0 & 1 \end{bmatrix} \cdot$$

$$\begin{bmatrix} C_3 & -S_3 & 0 & 160C_3 \\ S_3 & C_3 & 0 & 160S_3 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$H_3^{-1} = \begin{bmatrix} C(1-2)C_3 & -C(1-2)S_3 & S_{12} & 160C(1-2)C_3 + 82C(1-2) + 77C_1 \\ S_{12}C_3 & -S_{12}S_3 & -C(1-2) & 160S_{12}C_3 + 82S_{12} - 77S_1 \\ S_3 & C_3 & 0 & 160S_3 + 130 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$