Multi-Sensory Based Robot Dynamic Manipulation – Final Project Delivery Part 1

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DH tables

DH table for joints of UR10 robot (Figure 1)

Link i	θ_i	α_i	a	d
Link 1	q_1	$-90°$	0	L_1
Link 2	q_2+90°	0	-L_3	0
Link 3	q_3	0	-($L_5 - 115.7mm$)	0
Link 4	q_4+90°	+90°	0	L_2
Link 5	q_5	$-90°$	0	$+115.7mm$
Link 6	q_6	0	0	L_4

DH table for Center of Mass (CoM) of UR10 robot (Figure 2)

CoM i	θ_i	α_i	a	d
CoM 1	q_1	0	0	L_6
CoM 2	q_2+90°	0	-L_8	L_7
CoM 3	q_3	0	-L_{10}	$\frac{L_2}{2}$
CoM 4	q_4	0	0	L_2
CoM 5	q_5+90°	0	0	$+115.7mm$
CoM 6	q_6+90°	0	0	L_4

$$L_1 = 128mm$$
$$L_2 = 163.9mm$$
$$L_3 = 612.7mm$$
$$L_4 = 92.2mm$$
$$L_5 = 687.3mm$$
$$L_6 = 100mm$$
$$L_7 = 150mm$$
$$L_8 = \frac{L_3}{2}$$
$$L_{10} = \frac{L_5}{2}$$

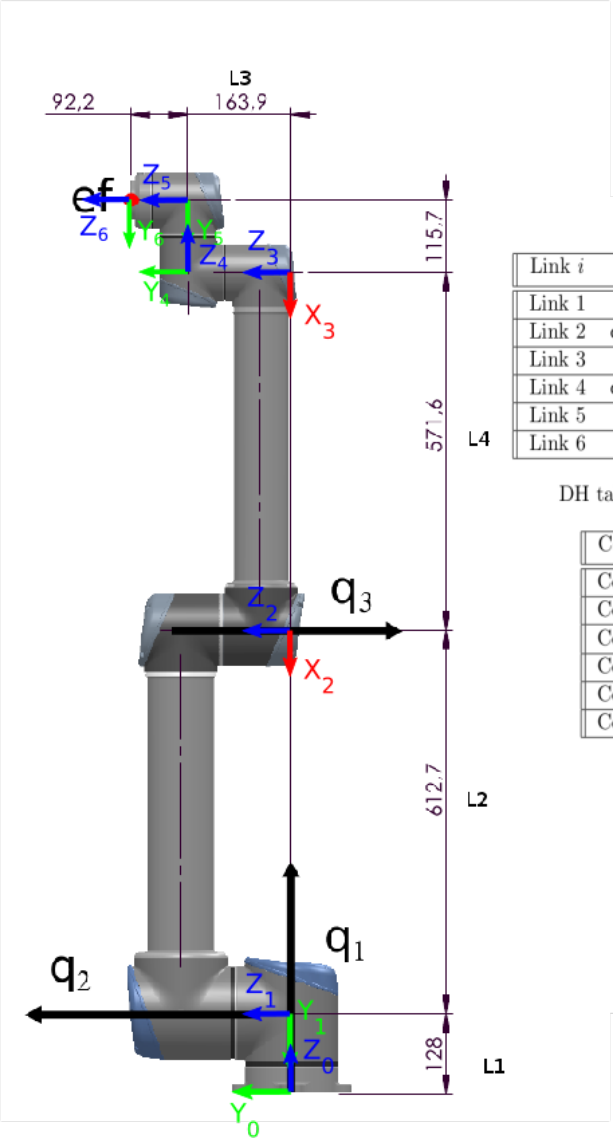

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Figure 7.4: Universal Robot UR-10 with dimensions and kinematic parameters. The black arrows depict the 3 axis of motion. For this exercise, the last 3 joints are considered as f xed joints (no actuation).

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Figure 1: Coordinate Frames of Links

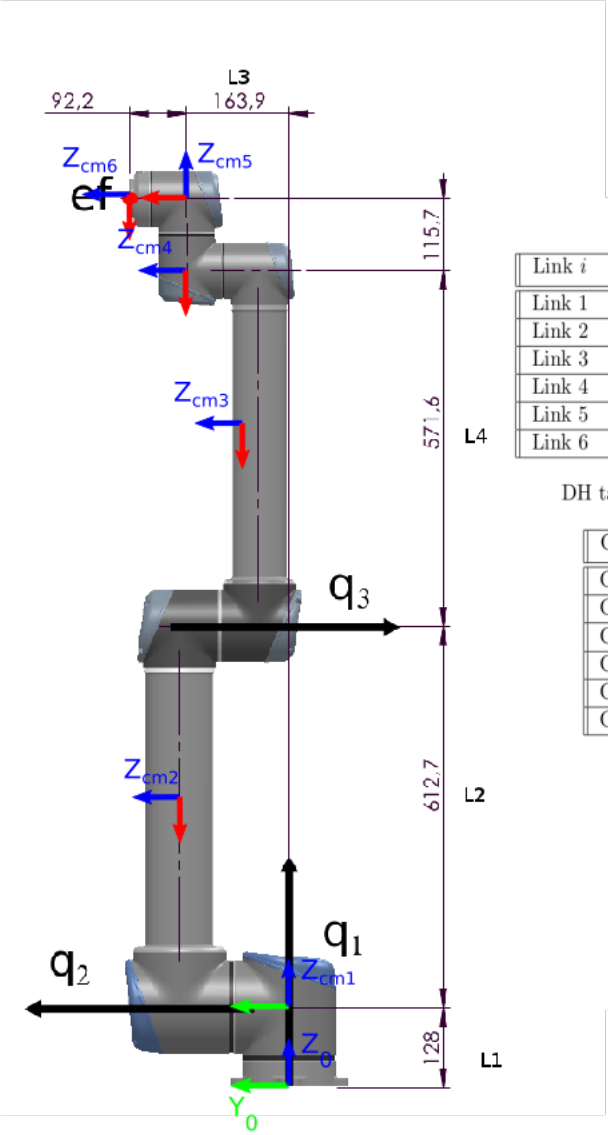

Figure 7.4: Universal Robot UR-10 with dimensions and kinematic parameters. The black arrows depict the 3 axis of motion. For this exercise, the last 3 joints are considered as fixed joints (no actuation).

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Figure 2: Coordinate Frames of CoMs