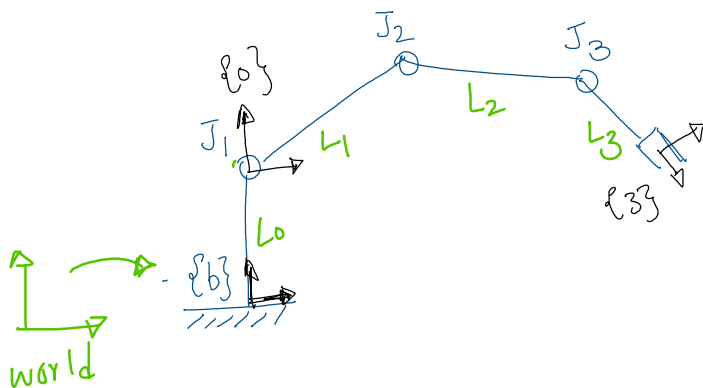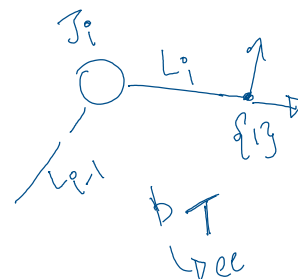# Kinematic chain

Monday, November 6, 2017   7:25 PM

- n joints
- n+1 Links
- $\{n+1\}$ coordinate frames
- J_i moves L_i
- $\{i\}$ At the tip of L_i
- $\{n\}$ End effector

$$^b T_{ee} = T_{L_0} T_{J_1}(q_1) T_{L_1} T_{J_2}(q_2) T_{L_2} T_{J_3}(q_3) T_{L_3}$$

$$= T_{L_0} \prod_{i=1}^{n} T_{J_i}(q_i) T_{L_i}$$

$$^{world} T_i \longrightarrow \text{Contains } 3 \quad 4 \times 4 \text{ matrices}$$

Static translation matrix + static and dynamic rotation m⟨

$$^{world} T_i = \;^{world}Trans_i * \;^{world}Rot\,St_i * \;^{world}Rot\,Dy_i$$

joint·origin.xyz

quaternion_about-axis()
joint_axis , joint_values.

quaternion from euler
(joint·origin· rpy)

7 DOF robot·

Links:
- world Link
- Calib lwr arm base Link⟨...⟩

Parent   Joints
$\{ \longrightarrow$ World link_lwr_arm⟨

calib_lwr_wrist_base_link } Child

lwr_arm_1_link	lwr_arm_0_join
lwr_arm_2_link	1
3	2
4	3
5	4
6	5
lwr_arm_7_link	lwr_arm_6_join
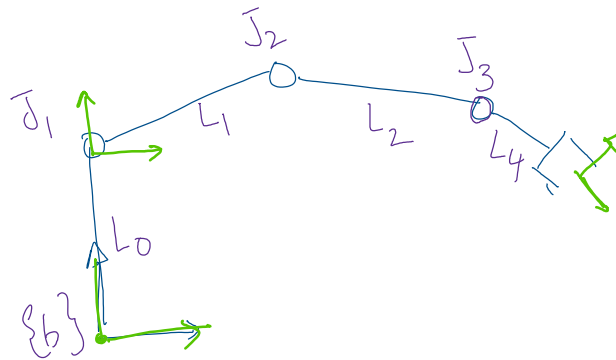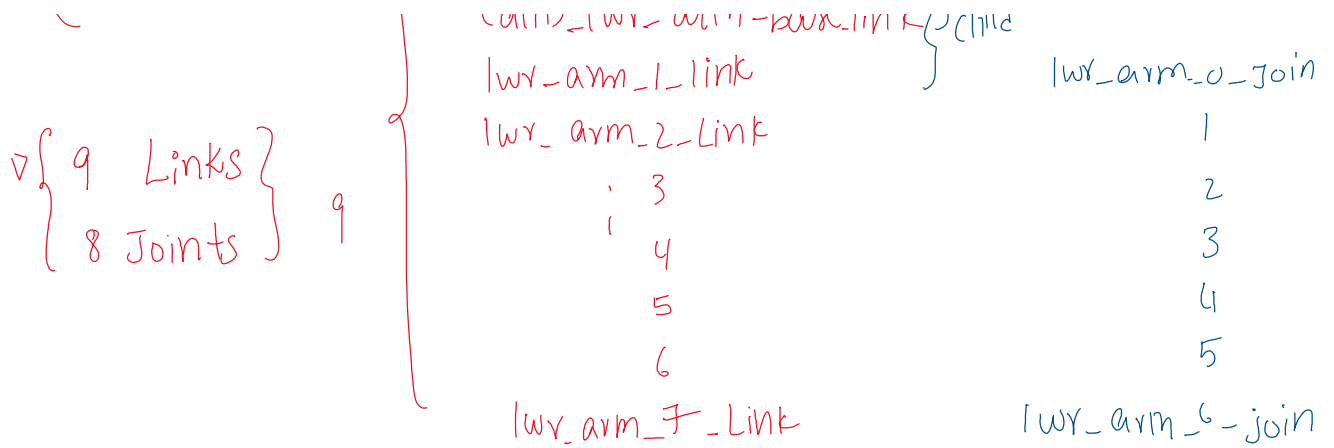
∇ { 9 Links }
{ 8 Joints } 9

3 DOF robot → 4 links, 3

In this case of lwr_arm robot

7 DOF but 9 links, 8 Joints.

calib_lwr_arm_base_link

calib_lwr_arm_base_joint

world link

First extra segment (don't have axis) type: fixed
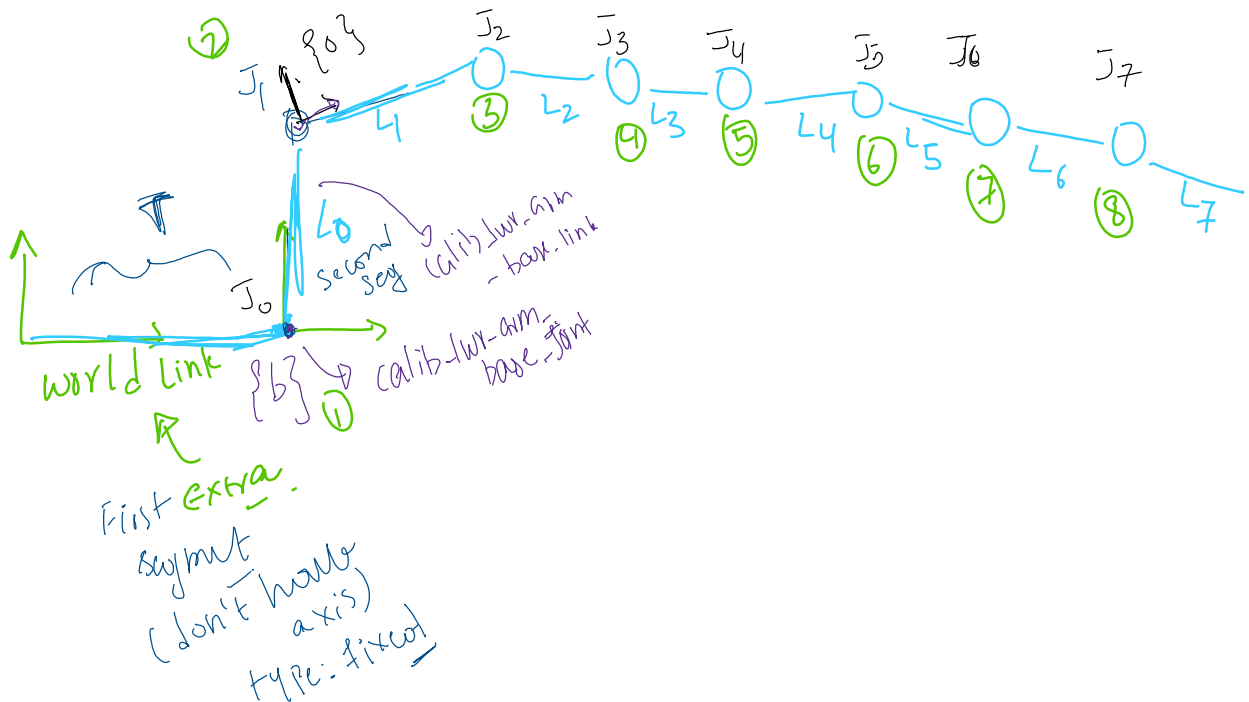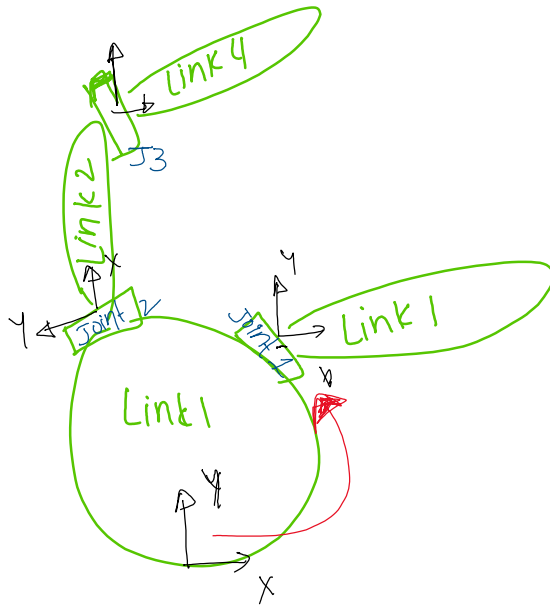
< Joint name = "joint 1" type="conti

< parent link:" link 1"/>

< child   , ..

< origin xyz:"-25 0" rpy=0

</ joint .