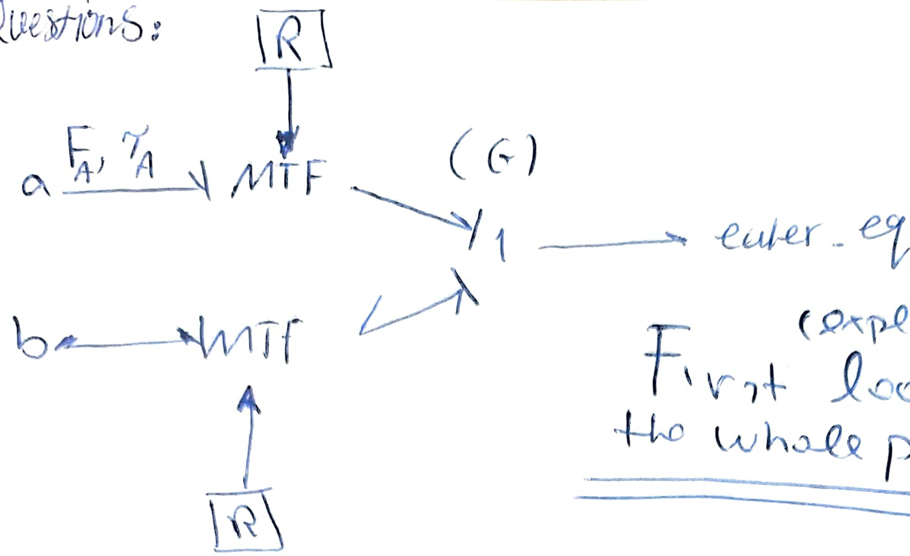
Questions:



(explain)
First look at the whole picture!

We give force and torque at A (coming from JOINT), we use transition matrix to compute them at G

$$\begin{pmatrix} F_G' \\ \tau_G' \end{pmatrix} = \begin{pmatrix} I & \phi \\ r'_{GA} \times \cdot & I \end{pmatrix} \begin{pmatrix} F_A' \\ \tau_A' \end{pmatrix}$$

→ body frame

show symmetric (written in body frame) ? 1

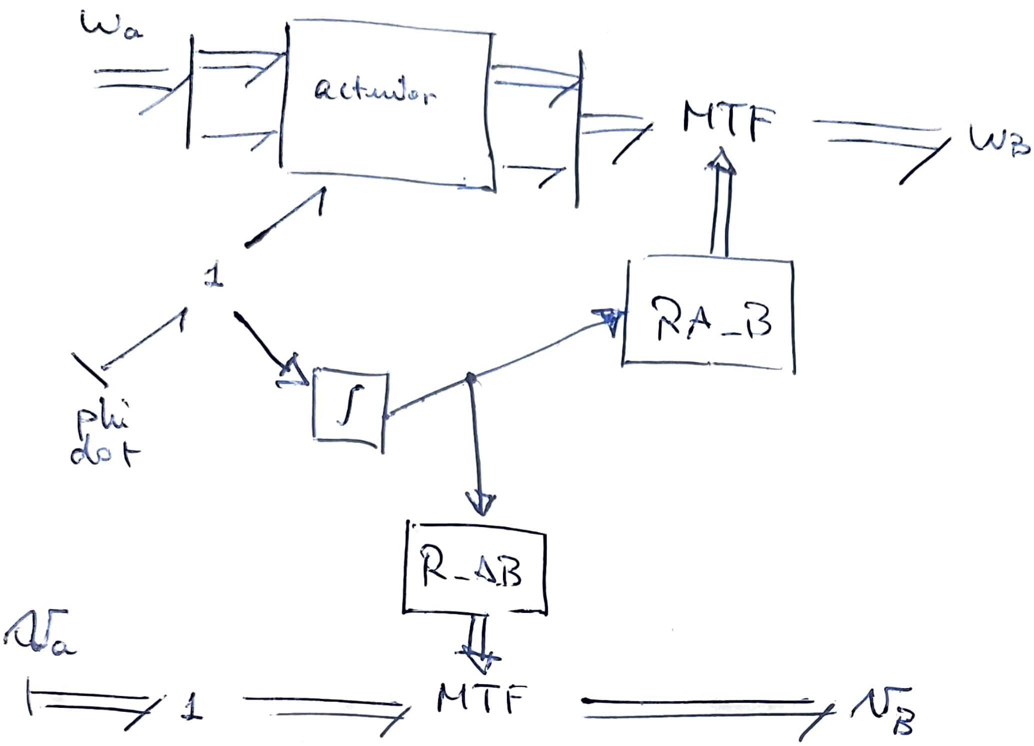
We move from A to G by means of a translation matrix (no rotation), with r_{GA}' being the vector from G to A written in the G frame.

Euler equations will run (the same professor did) and will give the flow to the 1 function.

Then we will go to second MTF ready in to frame B

Here we have a matrix from G to B, i.e., the transpose of the previous matrix we saw

JOINT

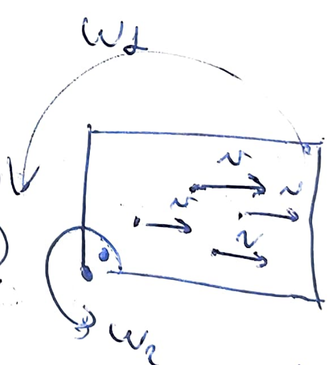


2

Is it φ angle the rotation q of the Joint?
Is it the integral coming from the harmonic drive model outside

4

$R_B^{A\,T}$ comes from the DH theory
is used to bring us from a point to another one, it is as follows?



$$v_P^A \longrightarrow R_B^{A\,T} \longrightarrow v_P^B$$

$$w_A^A \longrightarrow R_B^{A\,T} \longrightarrow w_B^B$$

3

Is it the reason why we write v_P^A and w_A^A and not $v_P A$?

5

we got flow (linear and angular velocity) from Joint but the input of the link is effort. So, do we need to put a GYRATOR in the middle, translating flow into effort (ratio?)

What is the indicator showing us simulation is correct?

we need to find out some parameters to put, also we inserted a flow in the first link equal to zero but we still look at a response in torque (it makes sense).

What are the next steps?

→ Harmonic Drive?

→ End effector?

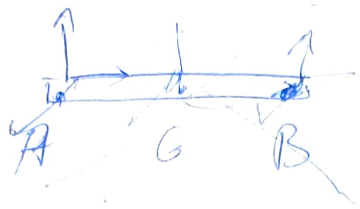
1_ change Rotation matrix in joint around z now

2- S_F change to S_e

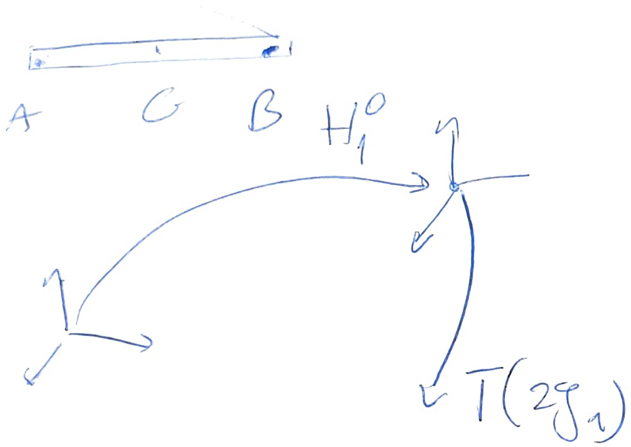
3- get a signal from euler eq, back to joint integral it to get ϕ.

4- ~~change~~ give the ROG_0 and P_CG_0 to denevit hartenberg

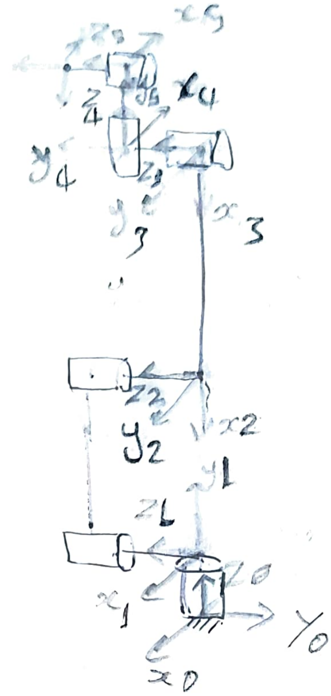
5- Add rotation matrix in Point a inside link


A
G
B

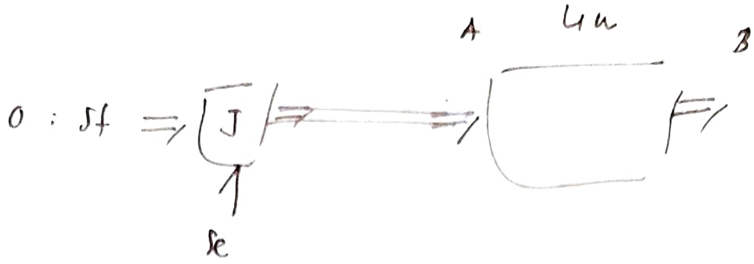

G1
G2

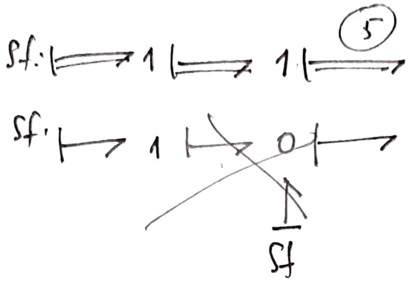

A
G
B
H1^0
T(2g1)

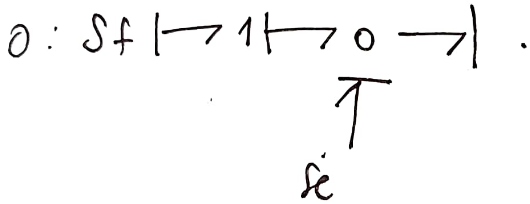
A2
A
B1

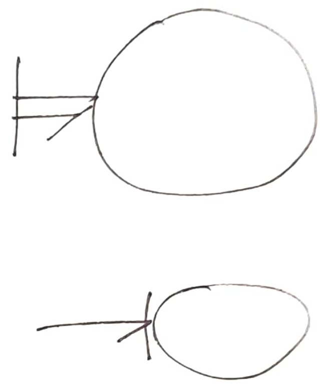


x5
z5
x4
z4
y4
z3
y3
x3
z2
y2
x2
y1
z1
z0
x1
Y0
x0





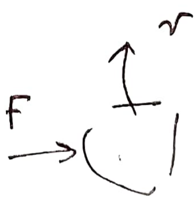




$$M\ddot{q} + C\dot{q} + G = \tau$$

$$q(t) = q^*(t)$$

$$\tau(t) = \tau^*(t)$$



$$\boxed{\begin{aligned} \dot{p} &= F \\ v &= \frac{p}{m} \end{aligned}}$$

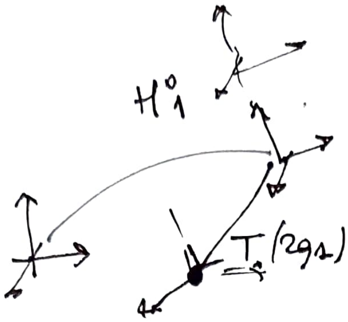
$$\frac{p_{k+1} - p_k}{\tau} = F_k$$

$$p_{k+1} = \underline{p_k} + \tau \underline{F_k}$$

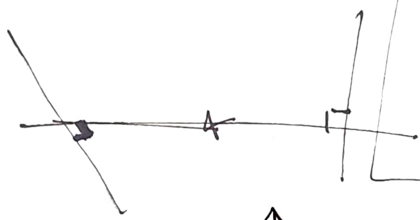
$$v_k = \frac{p_k}{m}$$

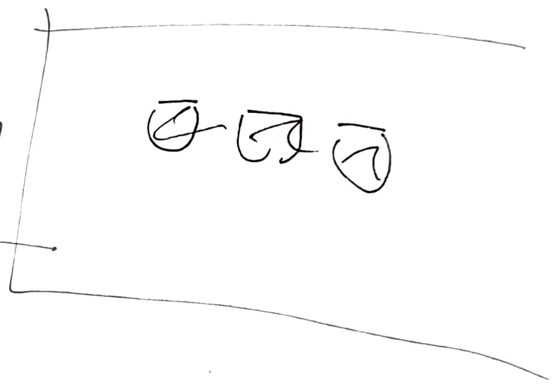
~~T(d,z) R(θ)~~

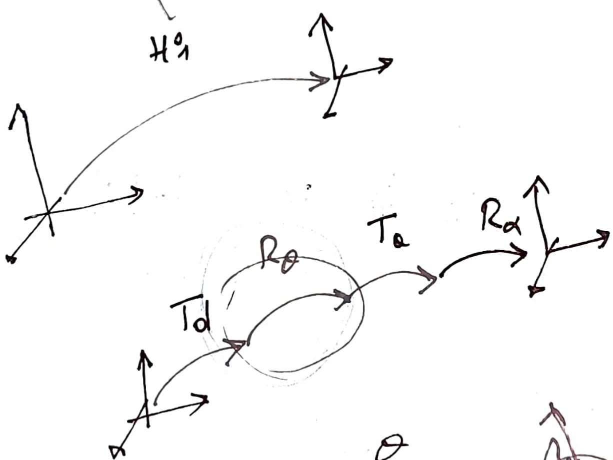
$$\underbrace{T(d,z)\,\overbrace{R(\theta,z)}^{\alpha}\,T(a,x)\,R(\alpha,x)}_{T(2g_1)} \qquad \underbrace{T(d,z)\,R^{\alpha}(\theta,z)}$$

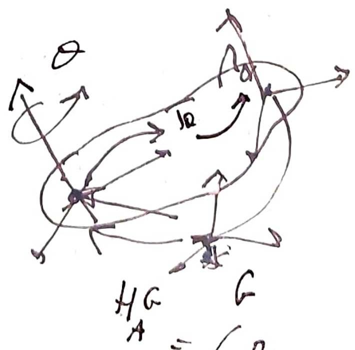


$T(2g_1)$







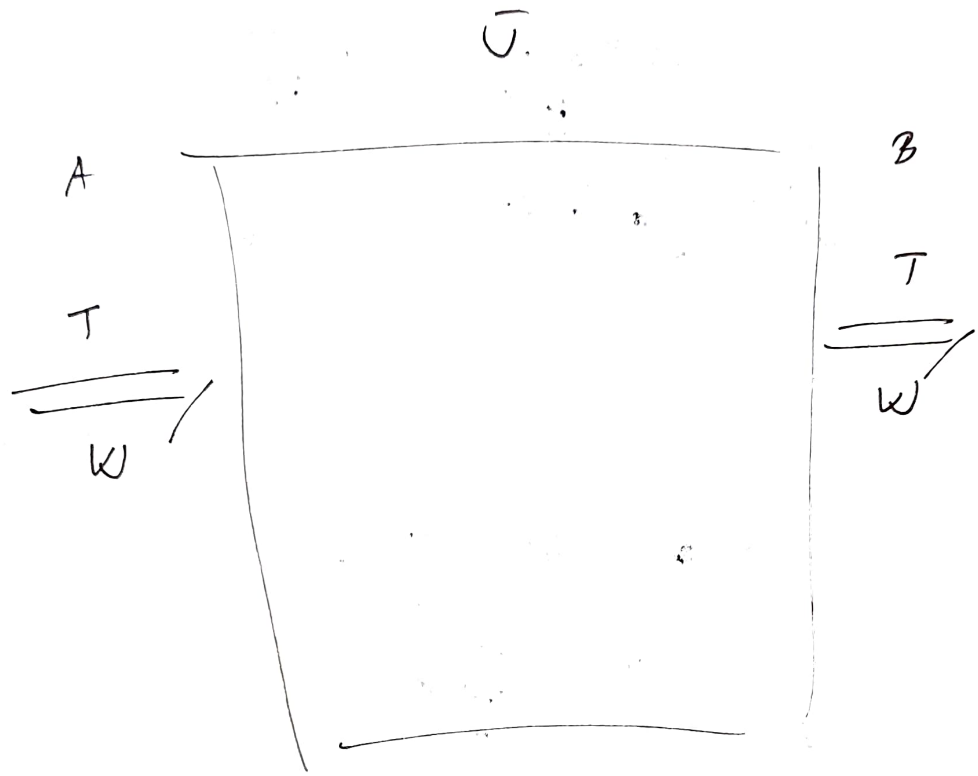


$H_i^{i-1}(\theta_i)$

$\theta_i(0)$

$$H_A^G = \begin{pmatrix} R & P \\ 0 & 1 \end{pmatrix}$$

Controllo mediante retroazione dello stato e assegnamento degli autovalori.



$v_A = pA.f[1..3,1]$

$w_A = pA.f[4..6,1]$