10. Lezione 29 ottobre

giovedì 29 ottobre 2020 08:34

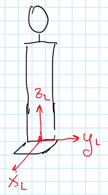
Regole di composizione

- rotazioni
- spost "generale"

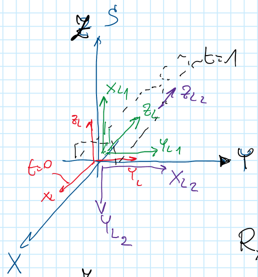
- rotaz. success. in terna fissa → a sinistra
- " " " " correnti → a destra

$$R_{1F} \swarrow R_0 \searrow R_{1C}$$

Vale in modo analogo per le T

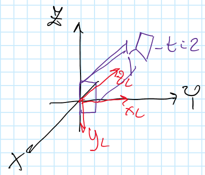


$S \leftrightarrow (G)$ GLOBALE (FISSA)



- $R_0 = R_{SL}(0) = I$
- $R_1 = R_{SL}(1) = R_y(-\pi/2)$
- R_2

FISSI: $R_x(-\frac{\pi}{2}) R_1$ CORRENTI: $R_1 R_z(\pi/2)$



Relazioni → t=2

SI METTE SOPRA 1. SI METTE SPR

a) $R_2 = R_x\left(-\frac{\pi}{2}\right) R_y\left(-\frac{\pi}{2}\right)$

b) $R_2 = R_y\left(\frac{\pi}{2}\right) R_z\left(\frac{\pi}{2}\right)$

in generale

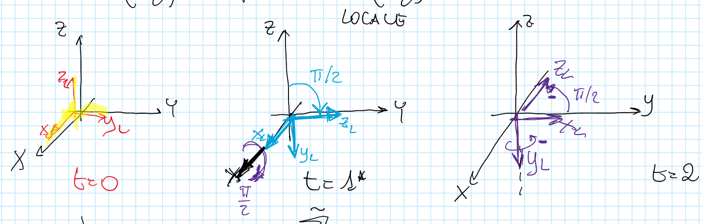
$R = R^* R^\#$

→ ASSI CORR

← ASSI FISSI

ALTRA LETTURA

a) $R_x\left(-\frac{\pi}{2}\right)$ poi $R_y\left(-\frac{\pi}{2}\right)$ LOCALE



X FISSO/LOCALE $(-\pi/2)$ · Y LOCALE $(-\pi/2)$

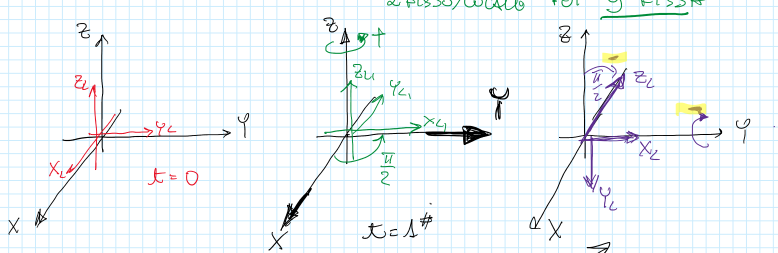
RICORDA

$$R^* R^\# \neq R^\# R^*$$

b) $R_2 = R_y(+\pi/2) R_z\left(\frac{\pi}{2}\right)$

→ y FISSO/LOCALE POI z LOCALE

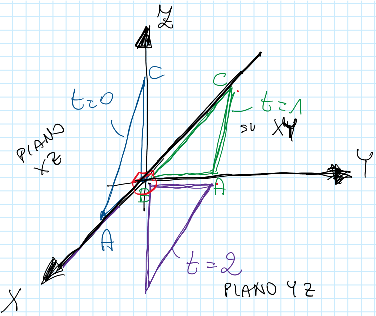
← z FISSO/LOCALE POI y FISSA

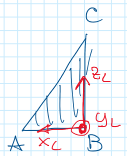


z FISSA $\left(\frac{\pi}{2}\right)$ Y FISSA $\left(-\frac{\pi}{2}\right)$

- Vale anche per le T

Esempio



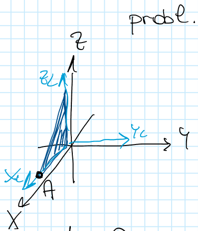


? Descrivere posizione triang. in S x $t=0,1,2$

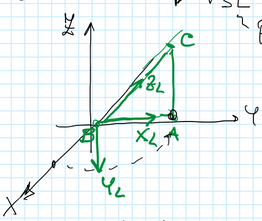
1) assegnare terna locale

prob. diviene $\longrightarrow T_{SL}(t) \quad t=0..2$

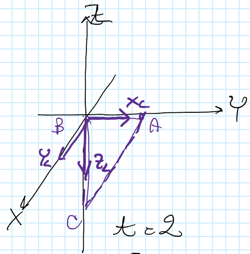
R_{SL}



$t=0$



$t=1$



$t=2$

$R_{SL}(0) = I$

$$R_{SL}(1) = \begin{bmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{bmatrix}$$

$[i_L]_S \ [j_L]_S \ [k_L]_S$

$$R_{SL}(2) = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

$R_{SL}(t)$

Fotografia istante

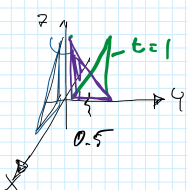
NON CONTIENE INFO SU "STORIA"

ALTRO METODO → CON ROTAZIONI ELEM. $0 \to 1 \quad 1 \to 2$

$R_{SL}(1) = R_y\left(\frac{\pi}{2}\right) R_z\left(+\frac{\pi}{2}\right)$

oppure

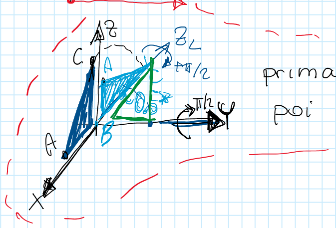
$R_{SL}(1) = R_z\left(\frac{\pi}{2}\right) R_x\left(-\frac{\pi}{2}\right)$



$$R_y(\theta) = \begin{bmatrix} c\theta & 0 & s\theta \\ 0 & 1 & 0 \\ -s\theta & 0 & c\theta \end{bmatrix}$$

$y_S \circ y_L \circ y_A \dots$

$R_y(\pi/2) \ R_z(+\pi/2)$



prima Y $(-\pi/2)$

poi Z LOCALE $(\pi/2)$

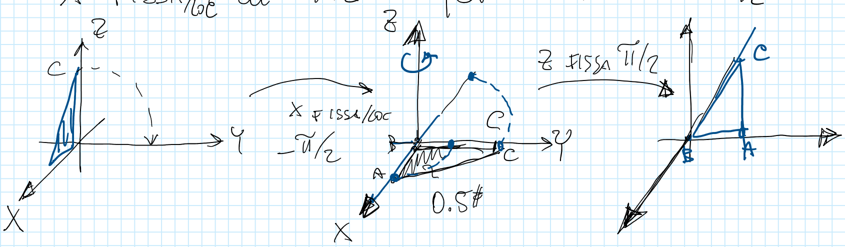
$R_y\left(-\frac{\pi}{2}\right) R_z\left(\frac{\pi}{2}\right)$

$R_{SL}(1) = R_z(\pi/2) \ R_x(-\pi/2)$

PRIMA $Z\left(\frac{\pi}{2}\right)$ POI X LOCALE $\left(-\frac{\pi}{2}\right)$

altra lettura

X FISSA/loc di $-\pi/2$ poi Z FISSA di $\pi/2$



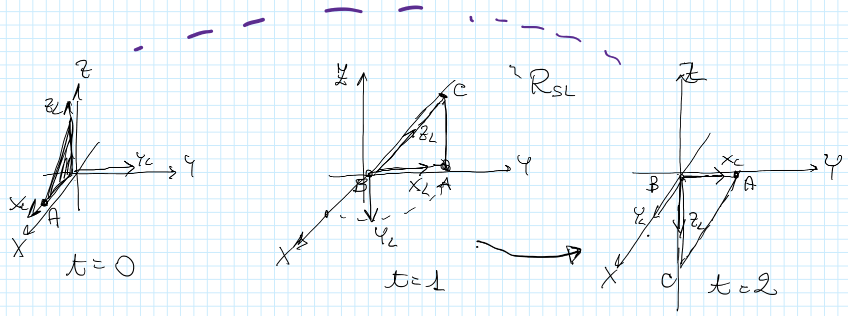
COMPLETARE ESERCIZIO

✓ $0 \to 1$ $\quad \cdot R_{SL}(1)$

• 0 → 1 → 2   • $R_{SL}(2) = R_{SL}(1)$

• 0 → 2

—— verifica Matlab



$R_{SL}(1)$ ⟶

$$R_{SL}(2) = R_y\left(\frac{\pi}{2}\right) R_{SL}(1) = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

$$\underbrace{R_{SL}(1)\, R_x\left(-\frac{\pi}{2}\right)}_{R(1\to 2)}$$

0 → 2

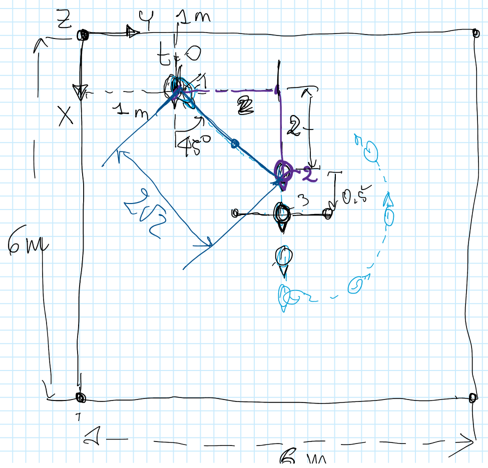
• $R_{SL}(2) = R_y(\pi)\, R_z(\pi/2) =$

$$\boxed{\begin{array}{l} \to R_x(\;)\ R_y(\;)\ R_z(\;) \\ \to \boxed{X,\ Y,\ Z} \\ \to R_z(\;)\ R_y(\;)\ R_x(\;) \end{array}}$$

$R(\underline{r}, \theta) = \boxed{R_z(\alpha)\, R_y(\beta)\, R_z(\theta)\, (\;)^T}$

• EUL. RODRIG.   ROT. ELEM.

Esercizio Matlab



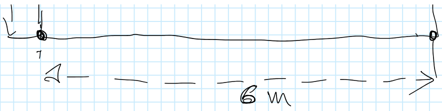
ATT. UNITÀ DI MISURA (cm)

• $T_{SL}(t) \to t$

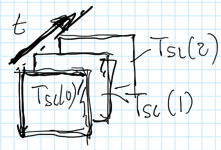
$\{O_{mi}\}_S = T_{SL}(t)\, \{O_{mi}\}_L$

$T_{SL}(t)$ $t = 0, 1, 2, 3$

t $\cdot T_{SL}0$



$\underline{T_{SL}(t)}$



$t = 0, 1, 2, 3$

- $T_{SL}0$
- $T_{SL}1$

$M(:,:,1)$

indice

for

$T_{SL}(i) = M(:,:,i)$

$\quad T_{SL}(i)\{P_{unx}\}$

end