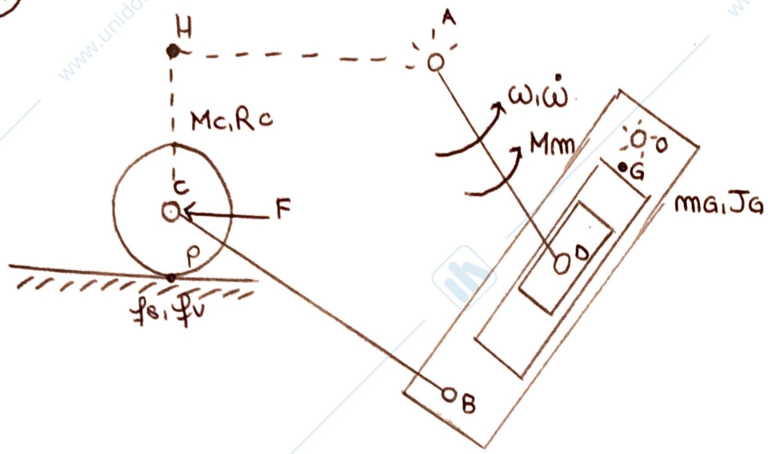
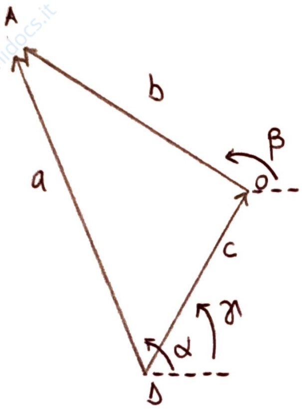
CERONE FEDERICA
10613601

(17)



- CHIUSURA 1:



$*(A-D)=(A-B)+(B-D)$

$*\, a e^{i\alpha} = b e^{i\beta} + c e^{i\gamma}$

$\lvert\ \rvert$	costi noto	costi noto	vari ?
$\measuredangle$	vari noto	costi noto	vari ?

$$\begin{cases} \dot\alpha = \omega \vec{k} \\ \ddot\alpha = \dot\omega \vec{k} \end{cases}$$

$\xrightarrow[\text{DERIVO}]{}$ $a\dot\alpha e^{i(\alpha+\pi/2)} = \dot c e^{i\gamma} + c\dot\gamma e^{i(\gamma+\pi/2)}$ $\longrightarrow$ PROIETTO SU $\mathbb{R}e$ ∧ $\mathbb{I}m$:

$$\begin{cases} \mathbb{R}e: & -a\dot\alpha \operatorname{sen}\alpha = \dot c\cos\gamma - c\dot\gamma \operatorname{sen}\gamma \\ \mathbb{I}m: & a\dot\alpha\cos\alpha = \dot c \operatorname{sen}\gamma + c\dot\gamma\cos\gamma \end{cases} \Longrightarrow \text{trovo } \dot c, \dot\gamma$$

$\xrightarrow[\text{DERIVO}]{}$ $a\ddot\alpha e^{i(\alpha+\pi/2)} - a\dot\alpha^2 e^{i\alpha} = \ddot c e^{i\gamma} + 2\dot c\dot\gamma e^{i(\gamma+\pi/2)} + c\ddot\gamma e^{i(\gamma+\pi/2)} - c\dot\gamma^2 e^{i\gamma}$

$$\begin{cases} \mathbb{R}e: & a\ddot\alpha \operatorname{sen}\alpha - a\dot\alpha^2\cos\alpha = \ddot c\cos\gamma - 2\dot c\dot\gamma \operatorname{sen}\gamma - c\ddot\gamma \operatorname{sen}\gamma - c\dot\gamma^2\cos\gamma \\ \mathbb{I}m: & a\ddot\alpha\cos\alpha - a\dot\alpha^2\cos\alpha = \ddot c \operatorname{sen}\gamma + 2\dot c\dot\gamma\cos\gamma + c\ddot\gamma\cos\gamma - c\dot\gamma^2 \operatorname{sen}\gamma \end{cases}$$

$\Downarrow$

trovo $\ddot c, \ddot\gamma$

con

$\dot\gamma$ = vel angolare del glifo

- CHIUSURA 2:

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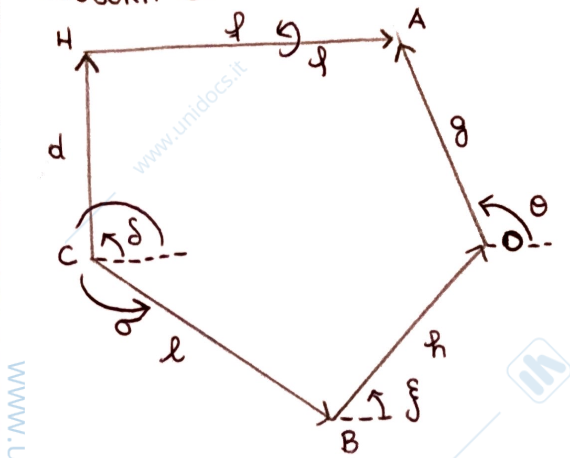

$*\ (H-C)+(A-H) = (A-O)+(O-B)+(B-C)$

$*\ d e^{i\delta} + f e^{i\varphi} = g e^{i\theta} + h e^{i\xi} + l e^{i\sigma}$

$\lvert\cdot\rvert$	cost noto	var, ?	cost noto	cost noto	cost noto
$\measuredangle$	cost noto $\pi/2$	cost noto $0°$	cost noto	var noto	var, ?

$$\left\{\begin{array}{l} \dot\xi = \dot\gamma \vec k \ ; \ \ddot\xi = \ddot\gamma \vec k \\ \theta = \beta \end{array}\right\}$$

$\xrightarrow{\text{DERIVO}}$ $\dot f e^{i\varphi} = h\dot\xi e^{i(\xi+\pi/2)} + l\dot\sigma e^{i(\sigma+\pi/2)}$

$$\begin{array}{l} \text{Re:} \\ \text{Imm:} \end{array}\left\{\begin{array}{l} \dot f\cos\varphi = -h\dot\xi\,\mathrm{sen}\,\xi - l\dot\sigma\,\mathrm{sen}\,\sigma \\ \dot f\,\mathrm{sen}\,\varphi = h\dot\xi\cos\xi + l\dot\sigma\cos\sigma \end{array}\right. \Longrightarrow \text{trovo } \dot f, \dot\sigma$$

$\xrightarrow{\text{DERIVO}}$ $\ddot f e^{i\varphi} = h\ddot\xi e^{i(\xi+\pi/2)} - h\dot\xi^2 e^{i\xi} + l\ddot\sigma e^{i(\sigma+\pi/2)} - l\dot\sigma^2 e^{i\sigma}$

$$\begin{array}{l} \text{Re:} \\ \text{Imm:} \end{array}\left\{\begin{array}{l} \ddot f\cos\varphi = -h\ddot\xi\,\mathrm{sen}\,\xi - h\dot\xi^2\cos\xi - l\ddot\sigma\,\mathrm{sen}\,\sigma - l\dot\sigma^2\cos\sigma \\ \ddot f\,\mathrm{sen}\,\varphi = h\ddot\xi\cos\xi - h\dot\xi^2\,\mathrm{sen}\,\xi + l\ddot\sigma\cos\sigma - l\dot\sigma^2\,\mathrm{sen}\,\sigma \end{array}\right. \Rightarrow \text{trovo } \ddot f, \ddot\sigma$$

$$\left\{\begin{array}{l} \vec v_C = \dot f \vec i \\ \vec v_C = \vec v_P + \vec\omega_C \wedge (C-P) = \omega_C \vec k \wedge (R_C \vec j) \end{array}\right\} \Rightarrow *\ \vec\omega_C = -\frac{\dot f}{R_C}\vec k \Rightarrow \dot{\vec\omega}_C = -\frac{\ddot f}{R_C}\vec k$$

$*\ \vec v_B = \vec v_O + \vec\omega_{GUFO} \wedge (B-O) = \emptyset + \dot\gamma \vec k\,(\overline{BO}\cos\xi\,\vec i + \overline{BO}\,\mathrm{sen}\,\xi\,\vec j) = \dot\gamma\overline{BO}\cos\xi\,\vec j - \dot\gamma\overline{BO}\,\mathrm{sen}\,\xi\,\vec i$

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$$*\, a_B = a_O + \vec{\dot{\omega}}_{GUFO} \wedge (B-O) - \omega^2_{GUFO}(B-O)$$
$$= \varnothing + \ddot{\gamma}\vec{k} \wedge (\overline{BO}\cos\xi\,\vec{i} + \overline{BO}\,\text{sen}\,\xi\,\vec{j}) - \dot{\gamma}^2(\overline{BO}\cos\xi\,\vec{i} + \overline{BO}\,\text{sen}\,\xi\,\vec{j})$$
$$= (\ddot{\gamma}\,\overline{BO}\cos\xi\, j - \dot{\gamma}^2\,\text{sen}\,\xi)\vec{j} - (\ddot{\gamma}\,\overline{BO}\,\text{sen}\,\xi + \dot{\gamma}^2\,\overline{BO}\cos\xi)\vec{i}$$

- TH. DELL'E. CINETICA:

$$*\, \frac{dE_c}{dt} = \sum W_j$$

(1)
$$\frac{dE_c}{dt} = \frac{d}{dt}\left[\frac{1}{2}M_c\vec{v}_c \times \vec{v}_c + \frac{1}{2}J_c\vec{\omega}_c \times \vec{\omega}_c + \frac{1}{2}m_a\vec{v}_a \times \vec{v}_a + \frac{1}{2}J_a\vec{\omega}_a \times \vec{\omega}_a\right] =$$
$$= M_c v_c a_c + J_c \omega_c \dot{\omega}_c + m_a(v_{ax}a_{Gx} + v_{ay}a_{Gy}) + J_a\omega_a\dot{\omega}_a$$

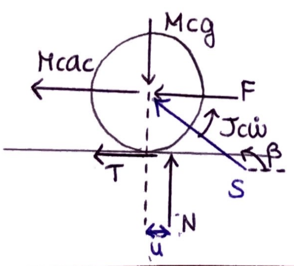
$$*\, \vec{v}_G = \vec{v}_O + \vec{\omega}_{GUFO} \wedge (G-O) = \varnothing + \dot{\gamma}k \wedge (\overline{GO}\cos\gamma\,\vec{i} + \overline{GO}\,\text{sen}\,\gamma\,\vec{j})$$
$$= \underbrace{\dot{\gamma}\,\overline{GO}\cos\gamma\,\vec{j}}_{v_{Gy}} - \underbrace{\dot{\gamma}\,\overline{GO}\,\text{sen}\,\gamma\,\vec{i}}_{v_{Gx}}$$

$$*\, \vec{a}_G = \vec{a}_O + \vec{\dot{\omega}} \wedge (G-O) - \omega^2(G-O) = \varnothing + \ddot{\gamma}\vec{k} \wedge (\overline{GO}\cos\gamma\,\vec{i} + GO\,\text{sen}\,\gamma\,\vec{j}) - \dot{\gamma}^2(\overline{GO}\cos\gamma\,\vec{i} + \overline{GO}\,\text{sen}\,\gamma\,\vec{j})$$
$$= \underbrace{(\ddot{\gamma}\,\overline{GO}\cos\gamma - \dot{\gamma}^2\,\text{sen}\,\gamma)\vec{i}}_{a_{Gx}} - \underbrace{(\ddot{\gamma}\,\overline{GO}\,\text{sen}\,\gamma + \dot{\gamma}^2\,\overline{GO}\cos\gamma)\vec{j}}_{a_{Gy}}$$

$$*\, J_c = \frac{1}{2}MR_c^2$$

$$*\, \sum W_{ATTIVE} = \vec{F} \times \vec{v}_c + M_c\cancel{\vec{g} \times \vec{v}_c}_{\perp} + M_m \times \vec{\omega} + M_a\vec{g} \times \vec{v}_G$$
$$= -F v_c + M_m\omega - M_a g v_{Gy}$$

$$*\, \sum W_{REATT} = -|N| f_v R_c |\omega_c|$$



$$\begin{cases} \sum F_x = 0 \Rightarrow -M_c a_c - F - T - S\cos\beta = 0 \\ \sum F_y = 0 \Rightarrow N - M_c g - S\,\text{sen}\,\beta = 0 \\ \sum M_c = 0 \Rightarrow N u - TR + J\dot{\omega} = 0 \end{cases}$$

↓
3eq + TH DELL'Ecin ⇒ trovo N, T, S, F

– Per la VERIFICA DI ADERENZA devo vedere se:

$|T| \leq f_s |N|$

(con T ∧ N calcolati dalle eq. di equilibrio).

⇓

se è verificata la disuguaglianza

⇓

c'è aderenza