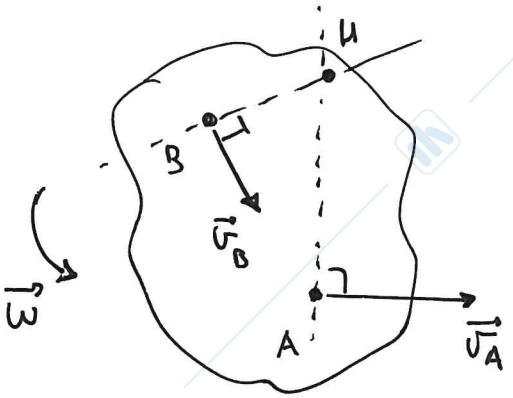
Teorema di Chasles (CIR)

$$\vec{v}_A = \vec{v}_H + \vec{\omega} \wedge (A - H)$$

$$\vec{v}_B = \vec{v}_H + \vec{\omega} \wedge (B - H)$$

vogliamo scrivere



$\exists$ un punto H t.c. $\vec{v}_H = 0$?

$$\vec{v}_A = \vec{\omega} \wedge (A - H)$$

$$\vec{v}_B = \vec{\omega} \wedge (B - H)$$

prima eq.

$$\begin{cases} v_{Ax}\vec{\imath} + v_{Ay}\vec{\jmath} = \omega\vec{k} \wedge \left((x_A - x_H)\vec{\imath} + (y_A - y_H)\vec{\jmath}\right) \\ v_{Bx}\vec{\imath} + v_{By}\vec{\jmath} = \omega\vec{k} \wedge \left((x_B - x_H)\vec{\imath} + (y_B - y_H)\vec{\jmath}\right) \end{cases}$$

$$v_{Ax}\vec{\imath} + v_{Ay}\vec{\jmath} = \omega(x_A - x_H)\vec{\jmath} - \omega(y_A - y_H)\vec{\imath}$$

$$v_{Ax}\vec{\imath} + v_{Ay}\vec{\jmath} = v_{Bx}\vec{\imath} + v_{By}\vec{\jmath} + \omega\vec{k} \wedge \left[(x_A - x_B)\vec{\imath} + (y_A - y_B)\vec{\jmath}\right]$$

Rivals

$$\begin{cases} v_{Ax} = v_{Bx} - \omega(y_A - y_B) \\ v_{Ay} = v_{By} + \omega(x_A - x_B) \end{cases}$$

$$\omega = \frac{v_{Bx} - v_{Ax}}{y_A - y_B}$$

$$\omega = \frac{v_{Ay} - v_{By}}{x_A - x_B}$$

$$\begin{cases} \begin{cases} v_{Ax} = -\omega(y_A - y_H) \\ v_{Ay} = \omega(x_A - x_H) \end{cases} \\ \begin{cases} v_{Bx} = -\omega(y_B - y_H) \\ v_{By} = \omega(x_B - x_H) \end{cases} \end{cases}$$

$$v_{Ax} = -\frac{v_{Bx} - v_{Ax}}{y_A - y_B}(y_A - y_H)$$

$$v_{Ax}y_A - v_{Ax}y_B = -v_{Bx}y_A + v_{Bx}y_H + v_{Ax}y_A - v_{Ax}y_H$$

$$y_H = \frac{v_{Ax}y_B - v_{Bx}y_A}{(v_{Ax} - v_{Bx})}$$

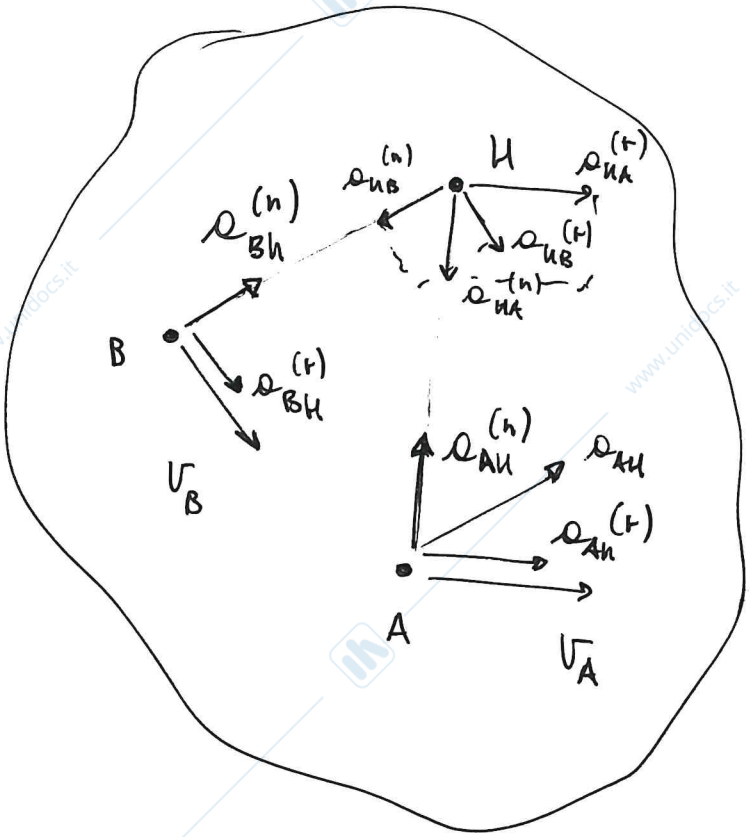
$$v_{Bx} = -\frac{v_{Bx} - v_{Ax}}{y_A - y_B}(y_B - y_H)$$

$$v_{Bx}y_A - v_{Bx}y_B = -v_{Bx}y_B + v_{Bx}y_H + v_{Ax}y_B - v_{Ax}y_H$$

$$y_H = \left(v_{Ax}y_B - v_{Bx}y_A\right) / \left(v_{Ax} - v_{Bx}\right)$$

$$\vec{a}_H = \vec{a}_A + \dot{\vec{\omega}} \wedge (H-A) - \omega^2 (H-A)$$

$$\vec{a}_H = \vec{a}_B + \dot{\vec{\omega}} \wedge (H-B) - \omega^2 (H-B)$$



$$\begin{cases} \vec{a}_A = \vec{a}_K + \dot{\vec{\omega}} \wedge (A-K) - \omega^2 (A-K \\ \vec{a}_B = \vec{a}_K + \dot{\vec{\omega}} \wedge (B-K) - \omega^2 (B-K \\ \vec{a}_B = \vec{a}_A + \dot{\vec{\omega}} \wedge (B-A) - \omega^2 (B-A \end{cases}$$

$\exists \; K \text{ t.c. } a_K = 0 ?$

~~$\vec{a}_B - \vec{a}_A = \dot{\vec{\omega}} \wedge (B-A) - \omega^2 (B-A) = \vec{a}_K + \dot{\vec{\omega}} \wedge (B-K) - \omega^2 (B-K)$~~

$$\vec{a}_{BH} = \vec{a}_{AH} + \dot{\omega}\,\vec{k} \wedge \left[(x_B - x_A)\vec{i} + (y_B - y_A)\vec{j} \right] + \omega^2 (x_B - x_A)\vec{i} + -\omega^2 (y_A - y_B)\vec{j}$$

$$a_{Bx} - a_{Ax} = -\dot{\omega}(y_B - y_A) - \omega^2 (x_B - x_A)$$

$$a_{By} - a_{Ay} = \dot{\omega}(x_B - x_A) - \omega^2 (y_B - y_A)$$