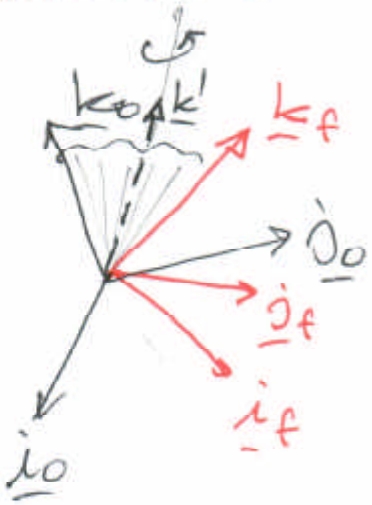
**Lezione 19/03/2004**

a) Pianificazione della traiettoria e del riferimento: continua ... testo pagg. 133-seguenti

19/03/04 (1)

# PIANIFICAZIONE ASSETTO

- ☑ ANGOLI — 3 PAR
- ☑ ASSE-ANGOLO — 1 PAR
- ☑ SCIVOLAMENTO PIANO — 2 PAR




2 Rotazioni da Comporre

1) intorno ad asse fisso $u$ $\perp$ piano $k_0 k_f$

2) intorno asse $k'$ locale

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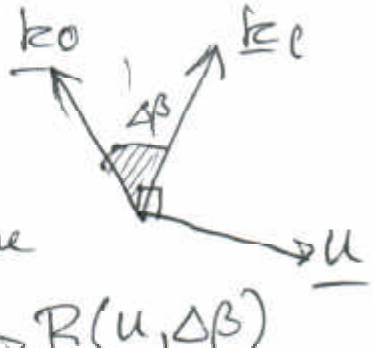


1ª Rotazione

$$u = \frac{k_0 \times k_f}{\|k_0 \times k_f\|} \sin\Delta\beta$$

$R(u, \Delta\beta)$

2ª Rotazione è intorno all'asse locale $\underline{k}$

di angolo $\Delta\alpha$

$$R(\underline{k}, \Delta\alpha) = \begin{bmatrix} c_\alpha & -s_\alpha & 0 \\ s_\alpha & c_\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\sin \Delta\alpha = \| \tilde{\dot{\jmath}}_0 \times \dot{\jmath}_f \|$$

↑ ?!?

$$\dot{\underline{\jmath}}_0 = R(\underline{u}, \Delta\beta)\, \dot{\underline{\jmath}}_0 \Rightarrow \tilde{\dot{\jmath}}_0 = R^T \dot{\jmath}_0$$

$$\sin \Delta\alpha = \| R^T \dot{\jmath}_0 \times \dot{\jmath}_f \|$$

19/03/2004 (3)

DATI $i_0, j_0, k_0$

$i_f, j_f, k_f$

ci calcoliamo •) $\underline{u}, \Delta\beta$

••) $\Delta\alpha$

Rot. totale $= R(\underline{u}, \Delta\beta)\, R(\underline{k}, \Delta\alpha) = R_T$

$$R_T(t) = R(\underline{u}, \beta(t))\, R(\underline{k}, \alpha(t))$$

$$\beta(t) = s(t)\,\Delta\beta$$
$$\alpha(t) = s(t)\,\Delta\alpha$$

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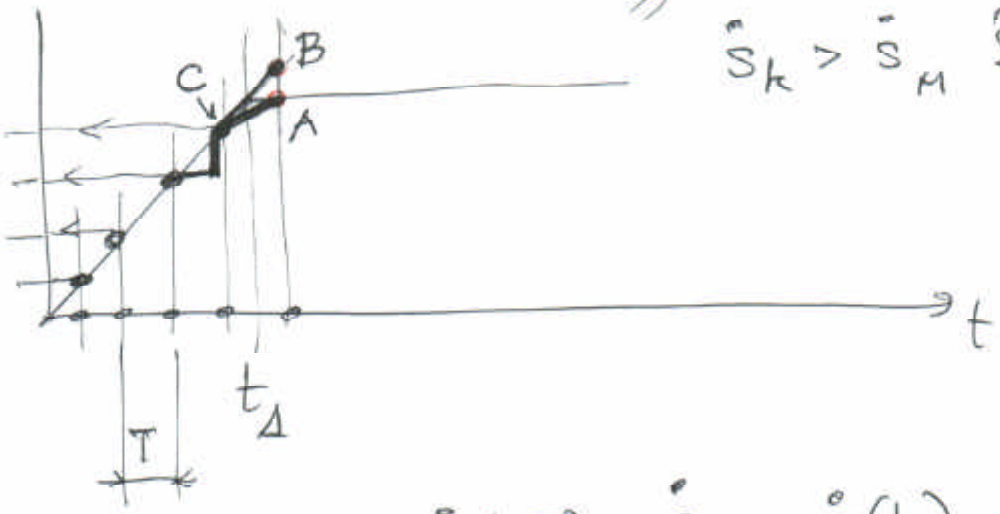
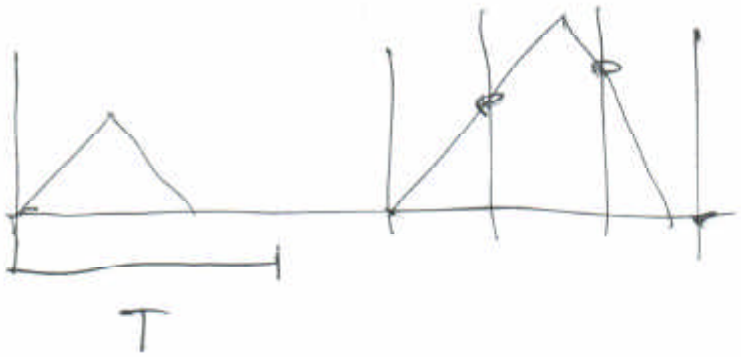
$s(t) \rightarrow s(kT)$

$\dot{s}_k > \dot{s}_M$ ?




$\dot{s}(kT) \equiv \dot{s}_k \equiv \dot{s}(k)$

$\frac{\Delta s}{T}$



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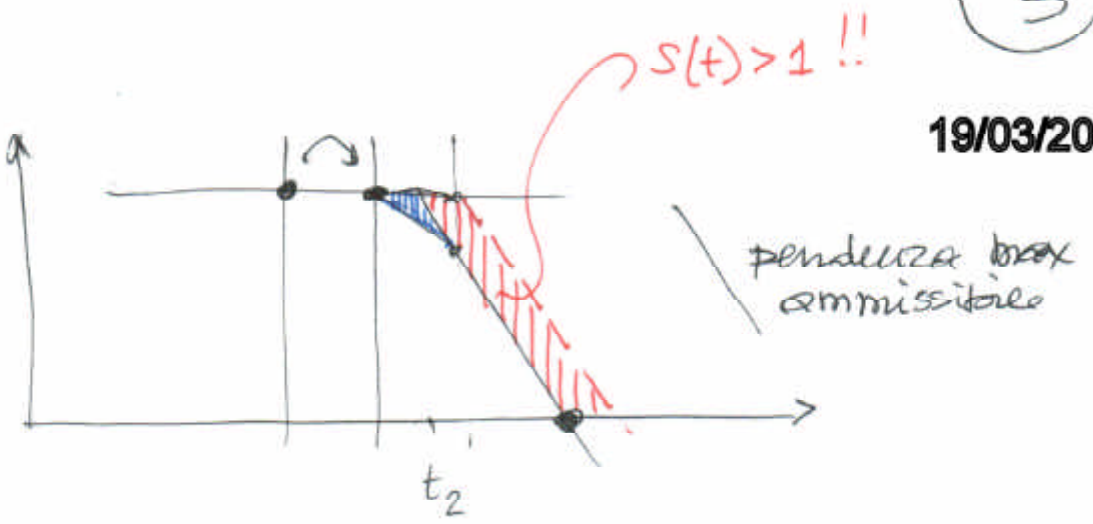
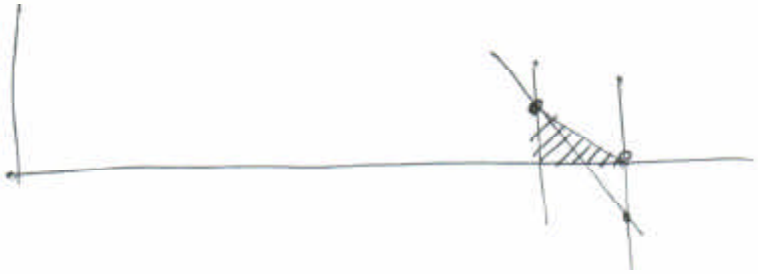
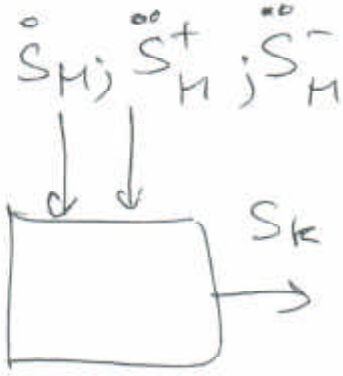


$s_{\underline{k}\ \text{finale}} \simeq 1 \pm \varepsilon$

$\dot{s}_{k\ \text{finale}} \simeq 0 \pm \varepsilon$

$\ddot{s}_{k\ \text{finale}} \simeq 0 \pm \varepsilon$






19/03/2004

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Generazione di $s(t) \Rightarrow s(k)$

Vincoli

$\dot{s}_{Mj}$ $\ddot{s}^{+}_{M\,j}$ $\ddot{s}^{-}_{M}$

$T$

$\Downarrow$

$s(k) = [\;]$ ; $\dot{s}(k)$ $[\;]$ $\ddot{s}(k) = [\;]$

$N_k$ FUORI LINEA

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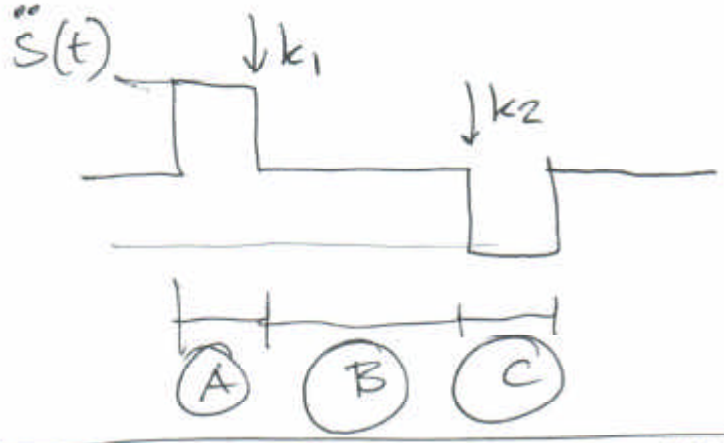
VA ~~FATTO~~ IN LINEA

REAL-TIME

19/03/2004

$$\ddot{s}_k = \begin{cases} \ddot{s}_M^+ & \text{A} \\ 0 & \text{B} \\ -\ddot{s}_M^- & \text{C} \end{cases}$$




$$\dot{s}_k = \begin{cases} \ddot{s}_M^+ kT + \dot{s}_0 \sim 0 & \text{A} \\ \dot{s}_M & \text{B} \\ \dot{s}_M - \ddot{s}_M^- (k-k_2)T & \text{C} \end{cases}$$

↑ k relativo al conteggio di profilo

$$s_k = \begin{cases} \frac{1}{2}\ddot{s}_M^+ k^2T^2 + \dot{s}_0 kT + s_0 & \text{A} \\ \dot{s}_M (k-k_1)T + s_1 \quad (s(k_1)) & \text{B} \\ -\frac{1}{2}\ddot{s}_M^- (k-k_2)^2T^2 + \dot{s}_M (k-k_2)T + s_2 & \end{cases}$$

k relativo al conteggio di profilo

# FORMULE RICORSIVE

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19/03/2004

DUE APPROCCI

- INTERPOLAZIONE INCREMENTALE
- " ASSOLUTA

- I. I. ≡ VELOCITA' ESATTA
  POSIZIONE APPROX.
- I. A. ≡ POSIZIONE ESATTA
  VELOCITA' APPROX.