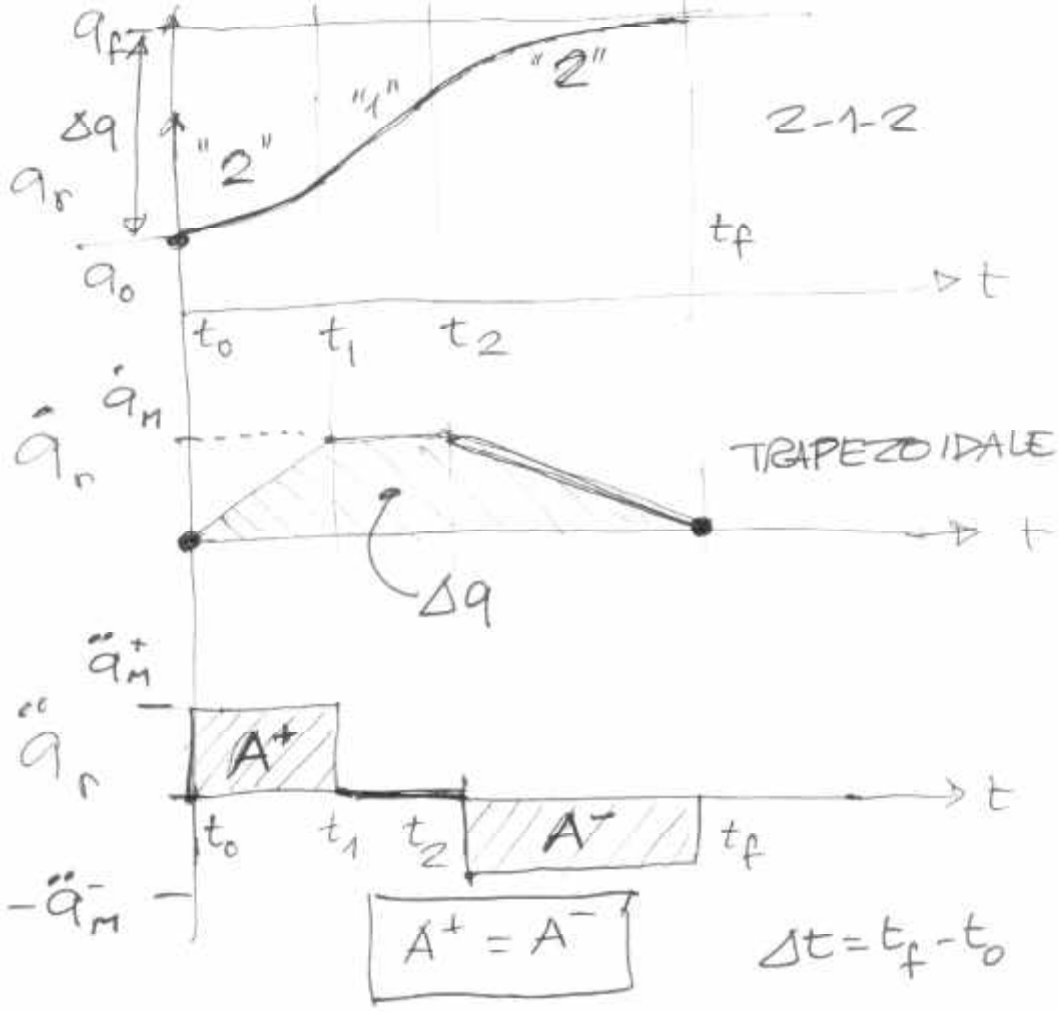
Lezione 17/03/2004

a) Pianificazione della traiettoria e del riferimento: testo pagg. 127-133

17/03/04

PIANIFICAZIONE DEL MOTO



tempo minimo (vincolato)

$\dddot{q} \equiv$ jerk

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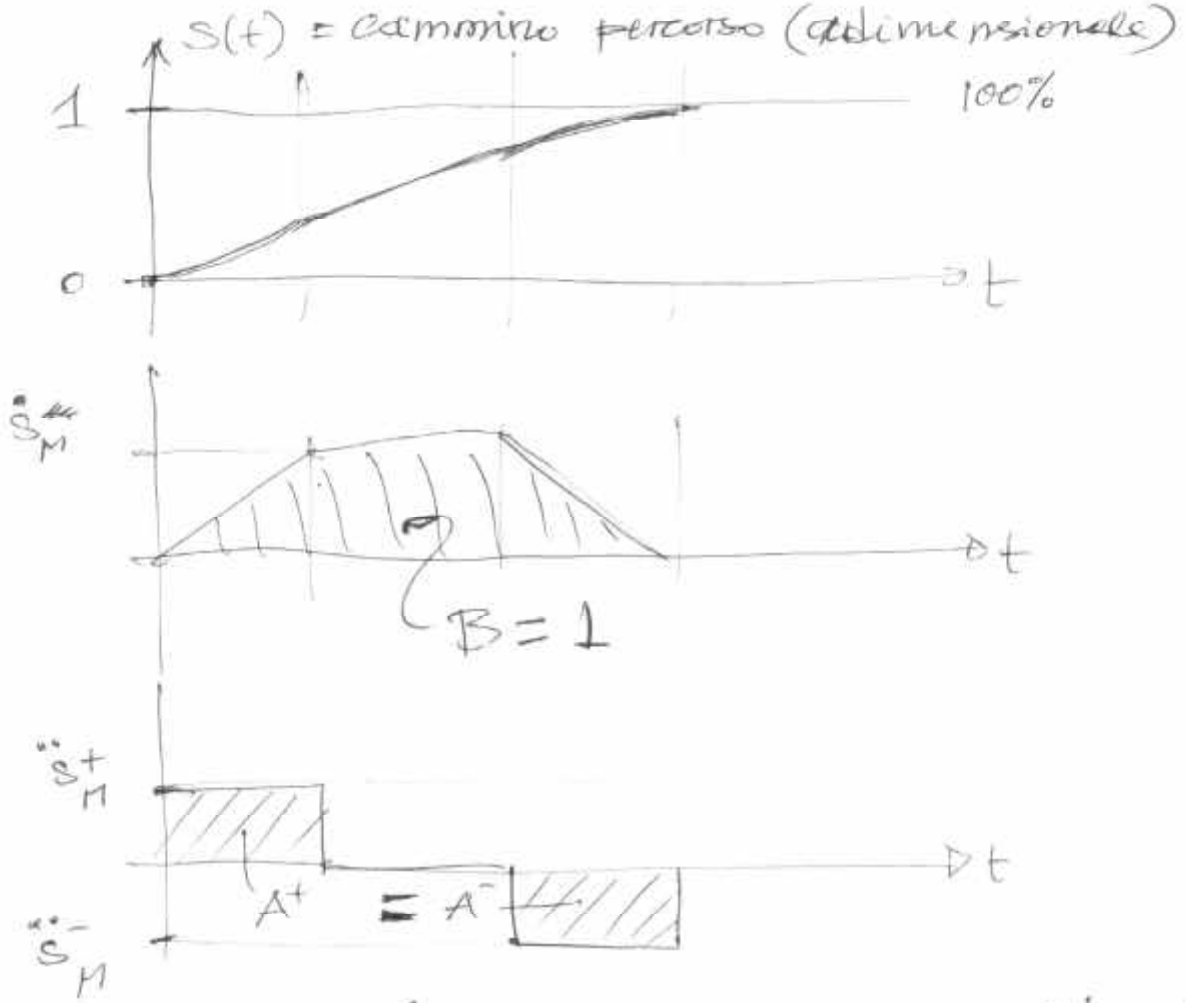
(2)

PIANIFICAZIONE ~~FATTA~~ CON ~~ATTROCCIO~~ = MOTO COORDINATO

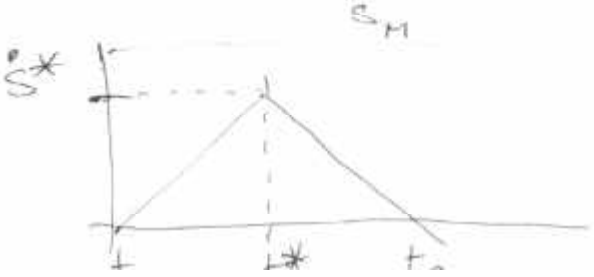


$$t_1 - t_0 = \frac{\dot{s}_M}{\ddot{s}_M^+}$$

$$t_2 - t_1 = \frac{1}{\dot{s}_M} - \frac{1}{2}\left[\frac{\dot{s}_M}{\ddot{s}_M^+} + \frac{\dot{s}_M^*}{\ddot{s}_M^-}\right]$$

Se $\frac{1}{2}\left[\frac{\dot{s}_M}{\ddot{s}_M^+} + \frac{\dot{s}_M}{\ddot{s}_M^-}\right] \geq \frac{1}{\dot{s}_M}$

allora traiettoria triangolare



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(3)

$s(t)$ calcolato da una
(continua)

$\dot{s}(t)$

$\ddot{s}(t)$

$$\underline{q}(t) = \underline{q}_0 + s(t)(\underline{q}_f - \underline{q}_0) = \underline{q}_0 + s(t)\Delta\underline{q}$$

combinazione convessa
lineare

$$= \underline{q}_0 + s(t)\underline{q}_f - s(t)\underline{q}_0 =$$

$$= (1 - s(t))\underline{q}_0 + s(t)\underline{q}_f$$

$$= \alpha \underline{q}_0 + \beta \underline{q}_f$$

$$\alpha + \beta \leq 1$$

$$\dot{\underline{q}}(t) = \dot{s}(t)\Delta\underline{q}$$

$$\ddot{\underline{q}}(t) = \ddot{s}(t)\Delta\underline{q}$$

PIANIFICAZIONE

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4

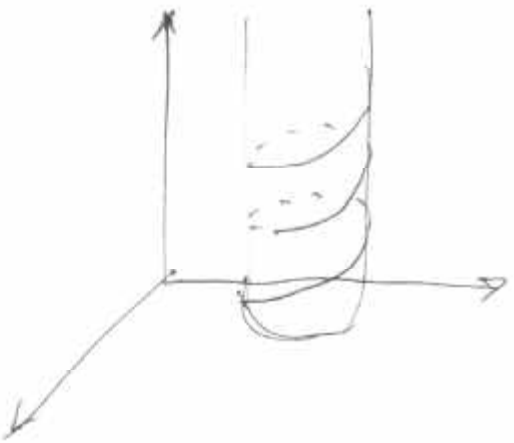
VARIABILI CARTESIANE

$\underline{p} = f(\underline{q})$ CIN DIRETTA POS

$\underline{q} = f^{-1}(p)$ " INVERSA POS

$\dot{\underline{p}} = J(q)\dot{\underline{q}}$ " DIRETTA VEL

$\dot{\underline{q}} = J^{-1}(q)\dot{\underline{p}}$ " INVERSA VEL



CERCHIO

$$x(t) = R\sin(\theta(t)) + x_c(t)$$
$$y(t) = R\cos(\theta(t)) + z(t)$$

$$z(t) = k(t)$$

CURVA GENERICA

5

CURVA MONODIMENSIONALE IN $\mathbb{R}^3$

$$\gamma(\underline{q}(\alpha(t))) = 0$$

PIANIF. PUNTO PUNTO

PIANIF. CONTINUA