Σχεδιασμός τροχιάς

Friday, November 13, 2020 11:38 AM

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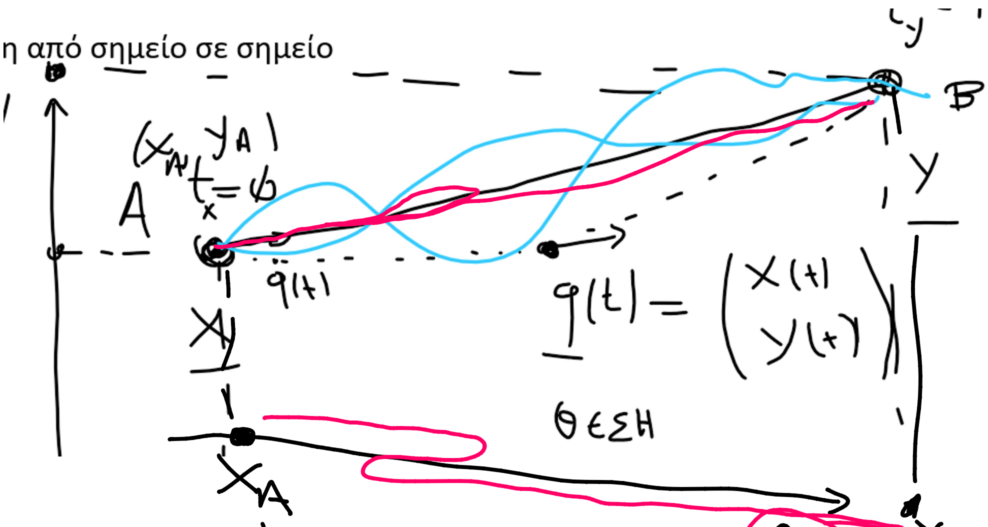


$$\underline{q}(t) = \begin{pmatrix} x(t) \\ y(t) \end{pmatrix}$$

ΘΕΣΗ

$x(t)$
$y(t)$

$x(0) = f(0) = x_A$

$x(T) = f(T) = x_B$

$$\boxed{\begin{aligned} x(0) &= x_A \\ y(0) &= y_A \\ x(T) &= x_B \\ y(T) &= y_B \end{aligned}}$$

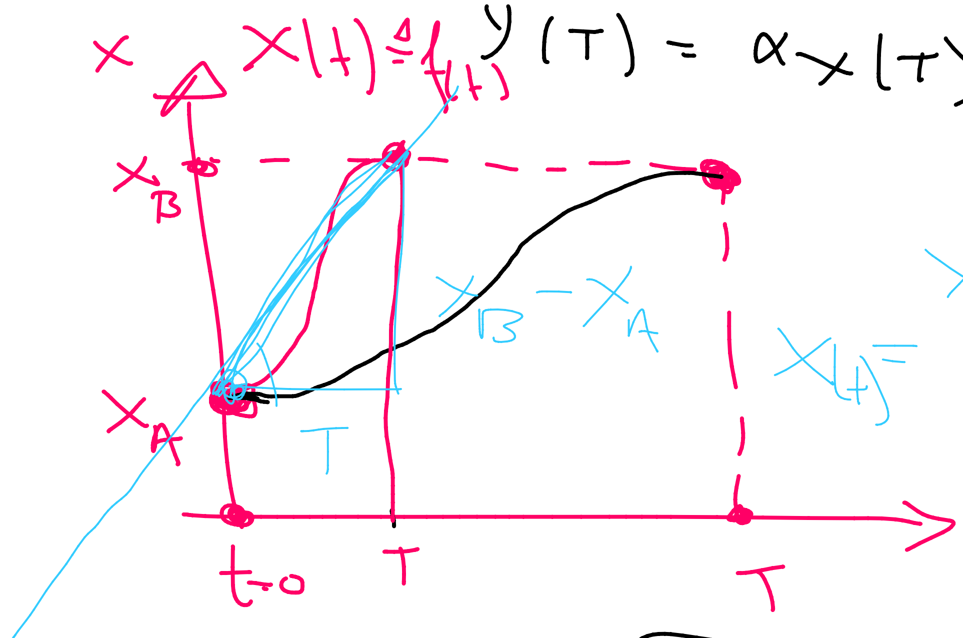
$x(t) = f(t)$

$$\boxed{y(t) = \alpha\, x(t) + \beta}$$

$y(0) = \alpha\, x(0) + \beta = \alpha x_A + \beta = y_A$

$y(T) = \alpha\, x(T) + \beta = \alpha x_B + \beta = y_B$

$\alpha = ;$
$\beta = ;$



$$x(t) = \frac{x_B - x_A}{T}\, t + x_A$$

$$\frac{\Delta x}{\Delta t} = \upsilon$$

$\dot{x}(0) = 0 \qquad \dot{y}(0) = 0$

$\dot{x}(T) = 0 \qquad \dot{y}(T) = 0$

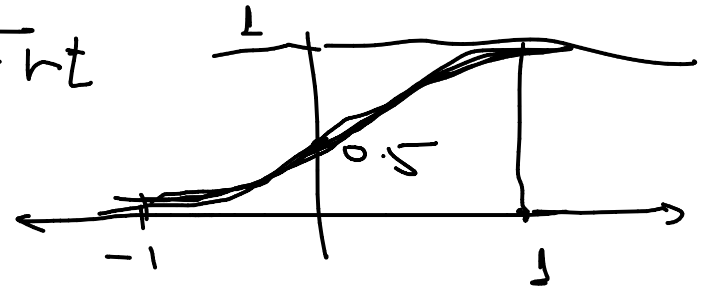
Δt

$$\boxed{x(T) = 0 \qquad y(T) = 0}$$

$x(t)$

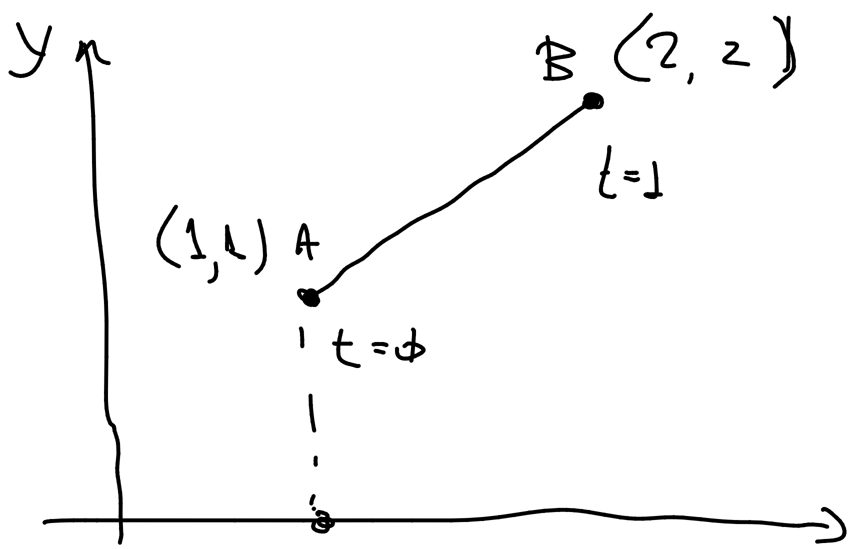
$$\boxed{\begin{aligned} x(0) &= x_A \\ x(T) &= x_B \end{aligned}}$$

$$f(t) = \frac{1}{1+e^{-rt}}$$



$$q(t) = \boxed{\begin{cases} x(t) = \dfrac{x_B - x_A}{T} \cdot t + x_A \\ y(t) = \alpha\, x(t) + \beta \end{cases}}$$

ΑΡΧΙΖΟΥΜΕ 12:20



$\boxed{x_A = 1}$

$x_B = 2$

$\boxed{y_A = 1}$

$y_B = 2$

x

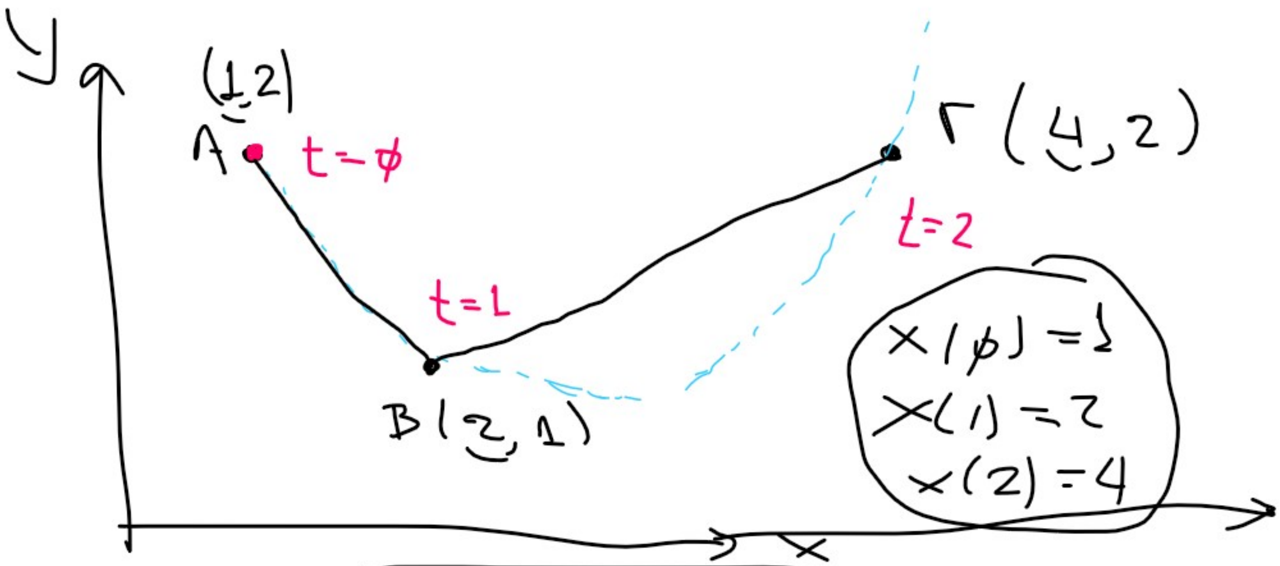
$\boxed{\begin{aligned} \alpha x_A + \beta &= y_A \\ \alpha x_B + \beta &= y_B \end{aligned}} \Rightarrow \begin{aligned} \alpha + \beta &= 1 \\ 2\alpha + \beta &= 2 \end{aligned} \xRightarrow{\alpha = 1} \boxed{\beta = \phi}$

$\ominus \quad \alpha = 1$

$\Downarrow$

$y(t) = x(t)$

$$\boxed{q(t) = \begin{cases} x(t) = t + 1 \\ y(t) = t + 1 \end{cases}}$$



$\boxed{x(t) = \cancel{s_1 t^3} + s_2 t^2 + s_3 t + s_4 = 1}$

$y(t) =$

$s_4 = x(\phi) = 1$

$x(\phi) = x_A = 1$

$x(1) = x_B = 2$

$x(2) = x_\Gamma = 4$

$y(t) = \alpha x^2(t) + \beta x(t) + \gamma$

$$\boxed{y(t) = \alpha x(t) + \beta x(t) + \gamma}$$

$$\left.\begin{aligned} 2 &= \alpha + \beta + \gamma \\ 1 &= 4\alpha + 2\beta + \gamma \end{aligned}\right\} \Rightarrow 3\alpha + \beta = -1$$

$$2 = 16\alpha + 4\beta + \gamma$$

$$\boxed{x(t) = S_1 t^3 + S_2 t^2 + S_3 t + S_4}$$

$$x(t) = S_2 t^2 + S_3 t + S_4$$

$$x(\emptyset) = 1 \Rightarrow \boxed{S_4 = 1}$$

$$x(1) = 2 = S_2 + S_3 + 1 \Rightarrow S_2 + S_3 = 1$$

$$x(2) = 4 = 4S_2 + 2S_3 + 1 = 4 \Rightarrow$$

$$S_2 + S_3 = 1$$

$$4S_2 + 2S_3 = 3$$

$$2s_{2_1} + 2s_3 = 2$$

$$2s_{2_1} = 1 \Rightarrow \boxed{s_2 = 1/2}$$

$$\boxed{s_3{}^1 = 1/2}$$

$$x(t) = \frac{1}{2}t^2 + \frac{1}{2}t + 1$$

$$y(t) = \underline{\alpha x^2(t) + \beta x(t) + \gamma}$$

$$\underline{v}(0) = \dot{\underline{\varphi}}(0) = \begin{Bmatrix} \dot{x}(0) \\ \dot{y}(0) \end{Bmatrix} =$$

$$= \begin{cases} t + \frac{1}{2} \Big|_{t=0} \\ 2\alpha\, x(t)\,\dot{x}(t) + \beta\,\dot{x}(t) \Big|_{t=0} \end{cases}$$

$$\dot{x}(0) = 0$$

$$y(\phi) = \phi$$

$$\dot{y}(\phi) = \phi$$

$$x(t) = S_1 t^3 + S_2 t^2 + S_3 t + S_4$$

$$x(\phi) = 1 \Rightarrow \boxed{S_4 = 1}$$

$$x(1) = 2 \Rightarrow S_1 + S_2 + \cancelto{\phi}{S_3} + 1 = 2$$

$$x(2) = 4 \Rightarrow 8S_1 + 4S_2 + 2\cancelto{0}{S_3} + 1 = 4$$

$$\dot{x}(\phi) = \phi \Rightarrow \boxed{S_3 = \phi}$$

$$S_1 + S_2 = 1 \Rightarrow \boxed{S_2 = \frac{5}{4}}$$

$$8S_1 + 4S_2 = 3$$

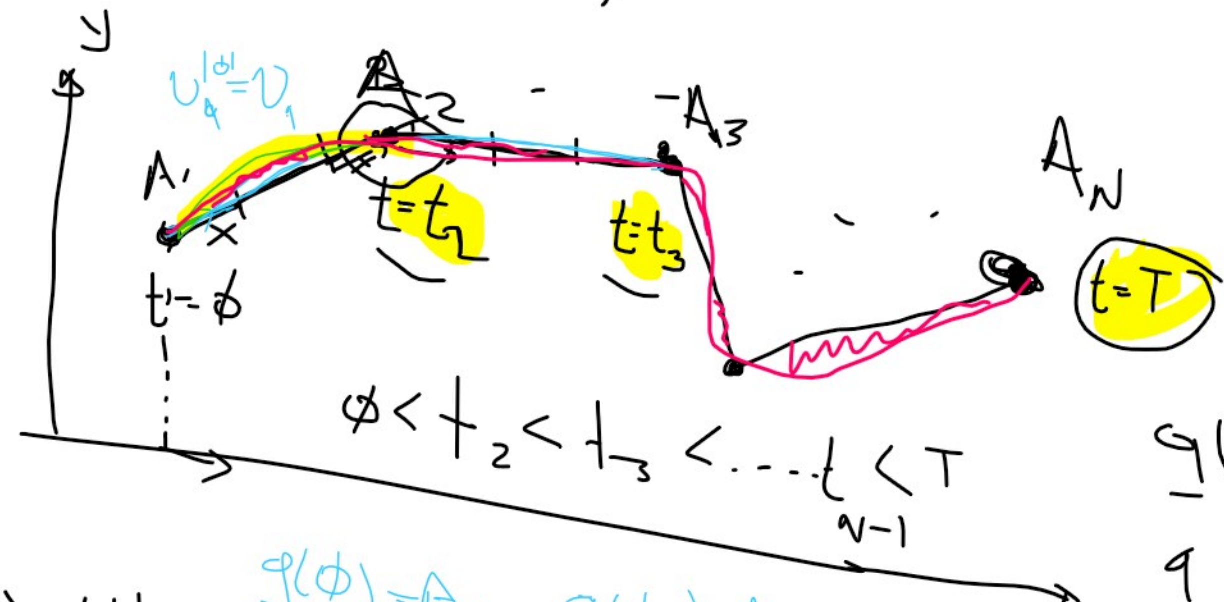
$$- \quad 4S_1 + 4S_2 = 4$$

$$4S_1 = -1 \Rightarrow \boxed{S_1 = -1/4}$$

$$\boxed{x(t) = -\frac{1}{4}t^3 + \frac{5}{4}t^2 + 1 \Big\} = q(t)}$$

$$\boxed{\left.\begin{array}{l} \ldots\ 4 \ \ldots \ \frac{\ }{4}\, t + 1 \\ y(t) = \alpha x^2(t) + \beta x(t) + \gamma \end{array}\right\} = \underline{q}(t)}$$

$$\dot{y}(0) = ? = 0$$



$$0 < t_2 < t_3 < \ldots t_{N-1} < T$$

$$\underline{q}(t_2) = \underline{A}_2$$

$$\underline{q}(t_3) = \underline{A}_3$$

$$\vdots$$

$$\underline{q}(t_{N-1}) = \underline{A}_{N-1}$$

$$\underline{q}(\underline{T}) = \underline{A}_N$$

$x(t)$

$y(t)$

$$\underline{q}(0) = \underline{A}_1 \qquad \underline{q}(t_2) = \underline{A}_2$$

$$\dot{\underline{q}}(0) = v_{A_1} \qquad \dot{\underline{q}}(t_2^{(-)}) = \dot{\underline{q}}(t_2^{(+)})$$

$$\ddot{\underline{q}}(t_2^{(-)}) = \ddot{\underline{q}}(t_2^{(+)})$$

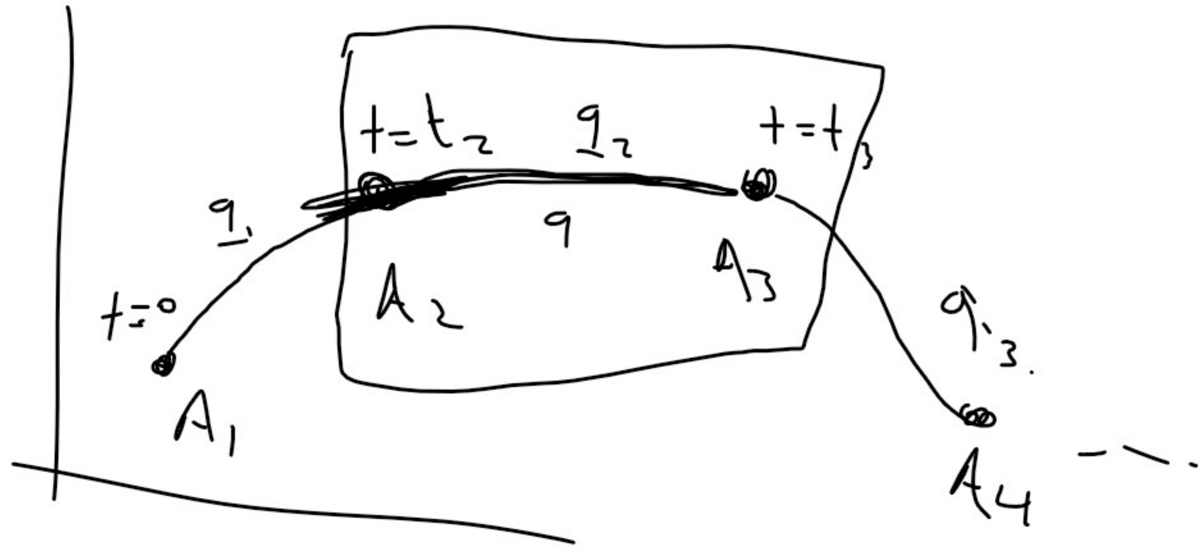
$$\dot{x}(0) = \dot{x}_{A_1} \qquad x(0) = x_{A_1}$$

$$\dot{y}(0) = \dot{y}_{A_1} \qquad y(0) = y_{A_1}$$

$$\underline{q}(0) = \underline{A}_1$$

$$\dot{\underline{q}}(0) = \underline{v}_{A_1}$$

$$\underline{q}(T) = A_N$$



$$\underline{q}_2(t) = \Big\{ \quad \underline{t_2} < t < \underline{t_3}$$

$$\left\{ \begin{array}{l} \underline{q}_1(t=t_{2-}) = \underline{q}_2(t=t_{2+}) = \underline{A}_2 \\ \dot{q}_1(t=t_{2-}) = \dot{q}_2(t=t_{2+}) \\ \ddot{q}_1(t=t_2) = \ddot{q}_2(t=t_{2+}) \end{array} \right.$$

$$\boxed{\left.\frac{\partial y_{q_1}}{\partial x_{q_1}}\right|_{t=t_{2-}} = \left.\frac{\partial y_{q_2}}{\partial x_{q_2}}\right|_{t=t_{2+}}}$$

$$|\dot{q}(t)| < |\underline{v}_{max}|$$

$$|(t)| < |\underline{U}_{max}|$$

AI {∂HTHP(-{ $\Longrightarrow$ ROBOT $\Longrightarrow$ $\begin{pmatrix} L \\ R \end{pmatrix} = \underline{f}\left(\underline{A}_1[m]\right)$

$\underline{A}_1[m]$