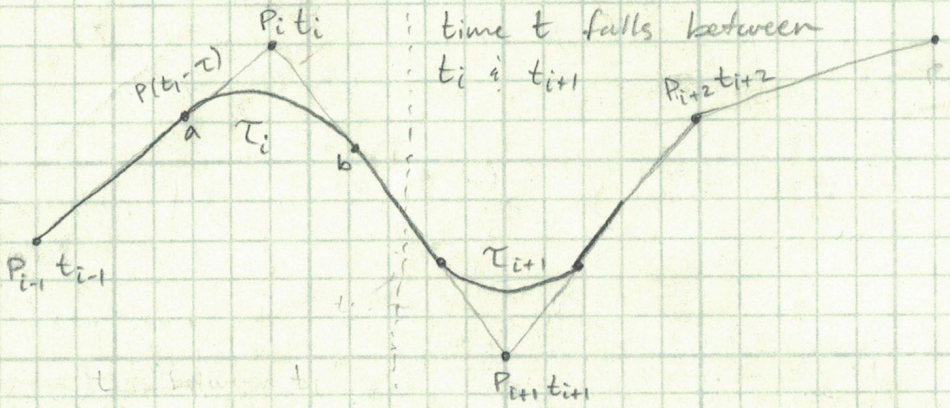
Function const AccelInterp()

t : scalar, single time value

transPercent : percentage of trajectory time to use for the constant acceleration

trajectory : $\begin{bmatrix} P_1 & P_2 & \cdots \\ t_1 & t_2 & \\ d_{11} & d_{12} & \\ d_{21} & d_{22} & \\ d_{31} & d_{32} & \\ d_{41} & d_{42} & \\ d_{51} & d_{52} & \end{bmatrix}$ T

$\tau = \text{trans}\%_0 \cdot (t_1 - t_0)$ transition $\in [0, 1)$



$$\tau_i = \tfrac{1}{2} \cdot \text{transPercent} \cdot \text{MIN}\left([t_{i+1} - t_i,\ t_i - t_{i-1}]\right) \qquad a_i = \frac{v_{i+1} - v_i}{2 \cdot \tau_i}$$

$$v_i = \frac{P_i - P_{i-1}}{t_i - t_{i-1}} \qquad v_{i+1} = \frac{P_{i+1} - P_i}{t_{i+1} - t_i}$$

If $t < (t_i + \tau_i)$

$$P(t) = P_{i-1} + v_i (t - t_{i-1}) + \tfrac{1}{2} \cdot \frac{v_{i+1} - v_i}{2\tau_i} (t - t_i + \tau_i)^2$$

$v(t) = v_i + a_i \cdot (t - (t_i - \tau_i))$

$a \triangleq \frac{v_{i+1} - v_i}{2 \cdot \tau_i}$

else if $t < (t_{i+1} - \tau_{i+1})$

$$P(t) = P_i + v_{i+1} \cdot (t - t_i) \qquad v(t) = v_{i+1} \qquad a = 0$$

else

$$P(t) = P_i + v_{i+1} (t - t_i) + \tfrac{1}{2} \frac{v_{i+2} - v_{i+1}}{2\tau_{i+1}} (t - t_{i+1} + \tau_{i+1})^2$$

$$v(t) = v_{i+1} + a_{i+1} \left(t - (t_{i+1} - \tau_{i+1})\right)$$

$$a(t) = \frac{v_{i+2} - v_{i+1}}{2 \cdot \tau_{i+1}}$$