Linear Interpolation for Arbitrary Angle/Distance

HL
2025-1-15
(Wed)

Objective: Compute Arbitrary Angle movement of W100 Based on the Limited Data using Look-up-table.

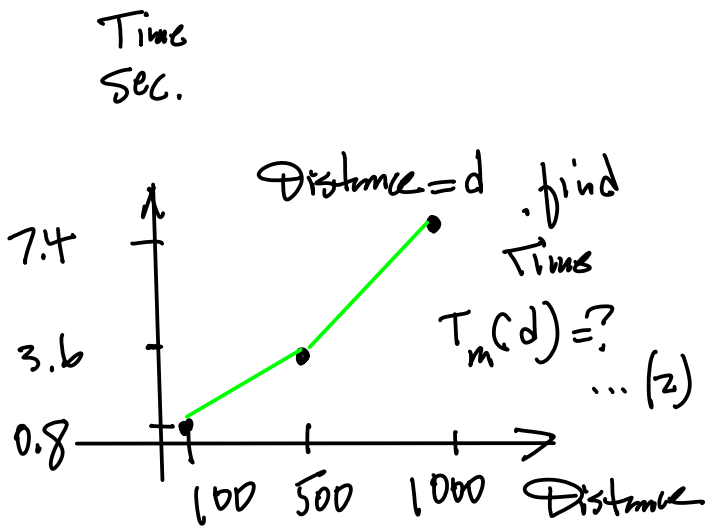
Example: For Angles

Angle in Degree	motion Command Left motor	Right motor

Example: For Distance

Distance in mm	motion Command Left motor	Right motor
100	0.8 sec.	Same
500	3.6 sec.	Same
1000	7.1 sec.	Same

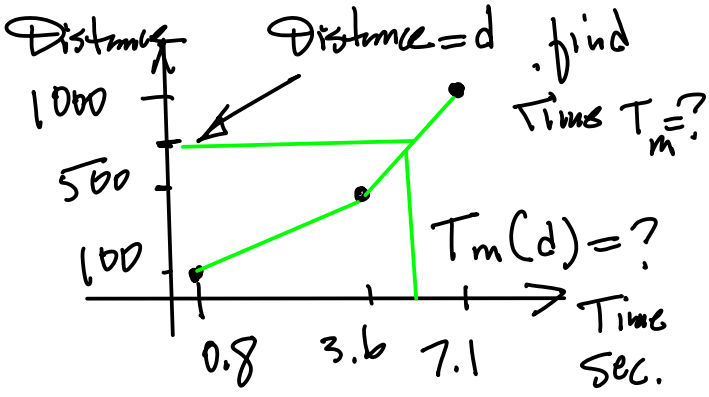
Table. 1.



$T_m(d)=?$ ... (2)

From Eqn(2) on the PPT, we have

$y = ax + b$ ... (3)



T_m ← Time OR, motor, $T_m(d)$ Time for the ... (1) distance d

Fig.1

find the Driving Time T_m, such that it will allow W100 to Reach to the Desired distance d.

where $a = \frac{y_1 - y_2}{x_1 - x_2}$ ... (4)

and $b = -\frac{y_1 - y_2}{x_1 - x_2} x_2 + y_2$ ... (5)

That is

$T_m(d) = a \cdot d + b$

From the User Input

$a = \frac{T_m(d_1) - T_m(d_2)}{d_1 - d_2}$ ... (6)

$b = -\frac{T_m(d_1) - T_m(d_2)}{d_1 - d_2} d_2 + T_m(d_2)$ ... (7)