LWPF software design

Aly El Din Mohamed

First we need to calculate angular frequency of the motor by the formula: $w = \frac{v}{2\pi r}$

where:
w is the angular frequency in radians per second,
v is the linear speed in meters per second, and
r is the radius of the wheel in meters.
Since the diameter of the wheel is given as 40 cm, the radius (r) can be calculated as half the diameter:
r=$\frac{0.4}{2} = 0.2m$
Using the given maximum speed of 0.5 m/s, we can calculate the angular frequency:
w=$\frac{0.5}{2\times0.2\times\pi} \approx 0.39788 rad/s$
converting to degree/second
w=$0.39788 rad/s \times \frac{180}{\pi} \approx 22.79 deg/rev$
The encoder has 540 pulses per 360 degree.
so to compute our maximum frequency it's obvious that:

$Fmax = \frac{540\times22.79}{360} \approx 34.196 pulse/rev$

So this is the cut off frequency which means that it's the frequency could be used in our system, and any higher frequency would be attenuated or completely eliminated