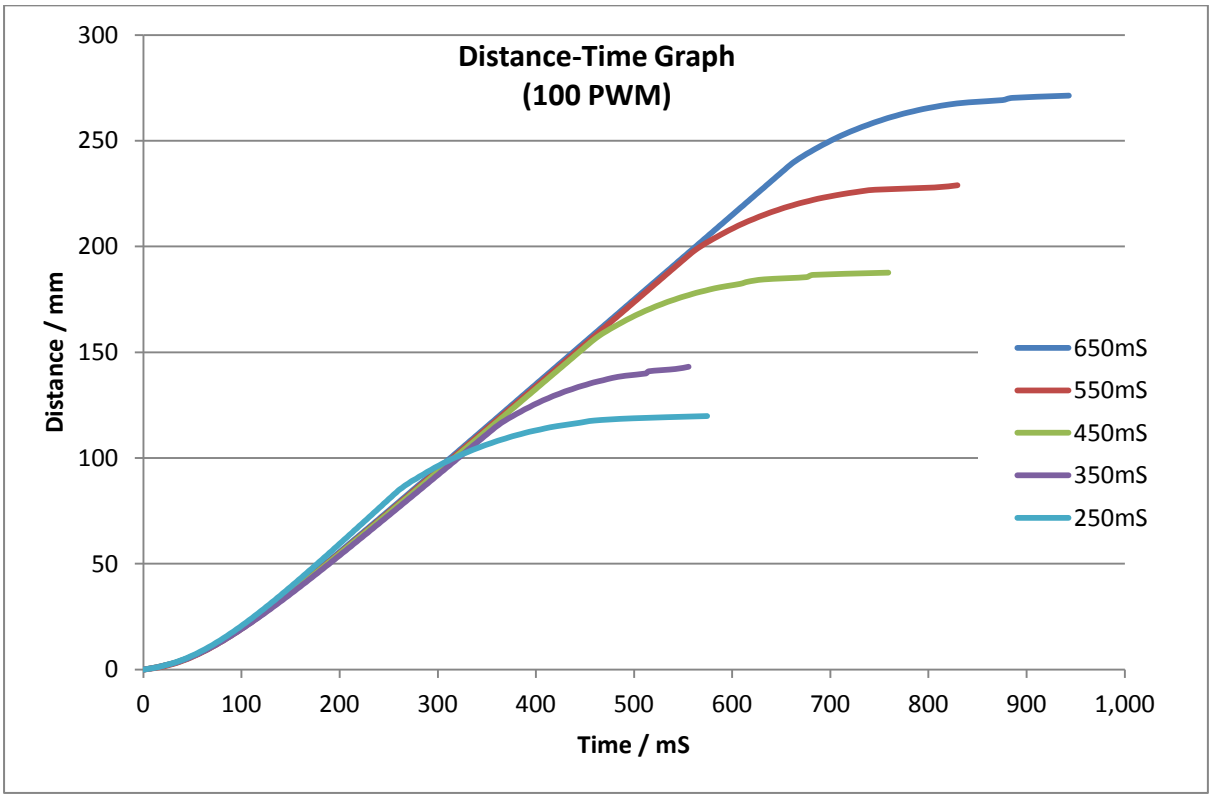
Distance-Time Graph

In this experiment I wrote a sketch to detect pulses from the wheel encoder and send the time since the start of the program (in uS) via bluetooth to the computer on every pulse.

Points to note:

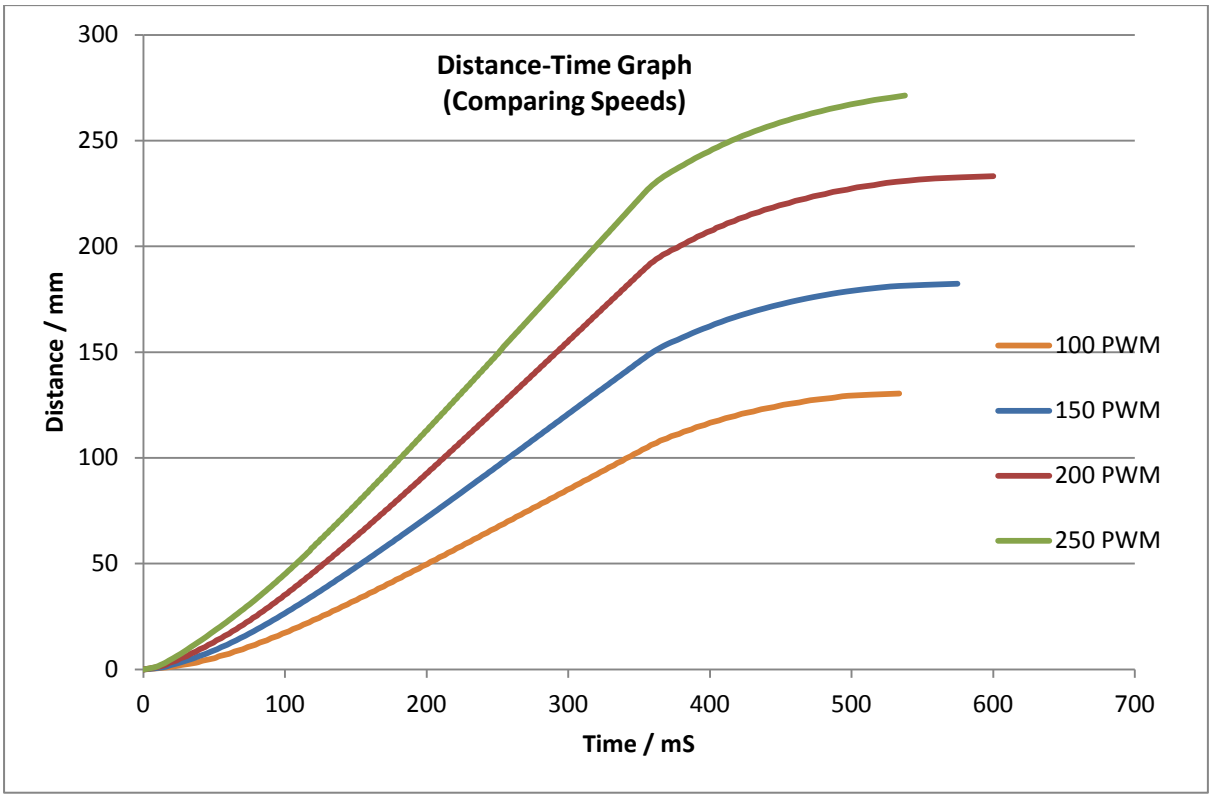
- I kept the motor speed the same and I varied the length of time that the motors were powered for
- There is no motor speed correction to make it drive perfectly straight
- When the motor power is stopped, the two sides of the motor are pulled LOW.
- The data assumes that the wheels aren't slipping (this could slightly influence the results)
- I took 10 repeat readings for each time and the average for each was used to plot on the graph



From this graph, I can see that at 100PWM, it takes approximately 120mS or 28mm to get to a constant speed.

As would be expected the acceleration is consistent no matter how long the motors are powered for.

In this experiment I repeated the test above and kept the time that the motors received power for the same and I varied the speeds.



I used the gradient of each line to work out the maximum velocity at each speed:

250PWM = 0.72ms^{-1}

200PWM = 0.63ms^{-1}

150PWM = 0.49ms^{-1}

100PWM = 0.3ms^{-1}

These speeds could change due to the battery voltage but they are a good guide.