1 Kinematics for omniwheel

Kinematics of four wheel omni wheel robot

$$\begin{bmatrix}\omega_1\\ \omega_2\\ \omega_3\\ \omega_3\end{bmatrix} = \frac{1}{R}\begin{bmatrix}\sin(\alpha_1) & \cos(\alpha_1) & R\\ \sin(\alpha_2) & \cos(\alpha_2) & R\\ \sin(\alpha_3) & \cos(\alpha_2) & R\\ \sin(\alpha_4) & \cos(\alpha_2) & R\end{bmatrix}\begin{bmatrix}V_x\\ V_y\\ \theta\end{bmatrix} \tag{1}$$

1.1 Bot dimension

- R (wheel radius) = 29mm
- $\alpha_1 = 0$
- $\alpha_2 = \frac{\pi}{2}$
- $\alpha_3 = \pi$
- $\alpha_2 = \frac{3\pi}{4}$

On equating **??** we get

$$\begin{bmatrix}\omega_1\\ \omega_2\\ \omega_3\\ \omega_3\end{bmatrix} = 1/R\begin{bmatrix}V_y + R\theta\\ V_x + R\theta\\ -V_y + R\theta\\ -V_x + R\theta\end{bmatrix} \tag{2}$$