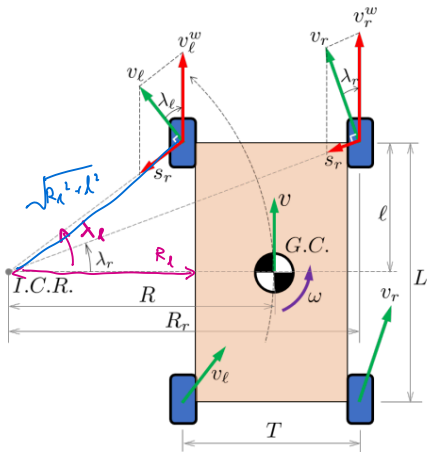
# Ex4) Tracked Wheel Model

- For the 4W differential drive shown in the previous slide, find the equation for left wheel to drive the G.C. at $v$ and $\omega$.




$$R_l = R - \frac{T}{2}$$

$$\tan\lambda = \frac{l}{R_l}$$

$$v = R\omega$$

$$V_l = \omega\sqrt{R_l^2 + l^2} = v_l^w \cos\lambda_l$$

$$v_l^w = \frac{\omega\sqrt{R_l^2 + l^2}}{\cos\lambda_l}$$

$$= \cdots$$

$$= \omega\left(R_r + \frac{l^2}{R_r}\right)$$

$$= v + \frac{T\omega}{2} + \frac{\left(\frac{L\omega}{2}\right)^2}{v + T\omega/2}$$

$$u_l = \frac{v_l^w}{r} = \frac{1}{r}\left(v + \frac{T\omega}{2} + \frac{\left(\frac{L\omega}{2}\right)^2}{v + T\omega/2}\right)$$