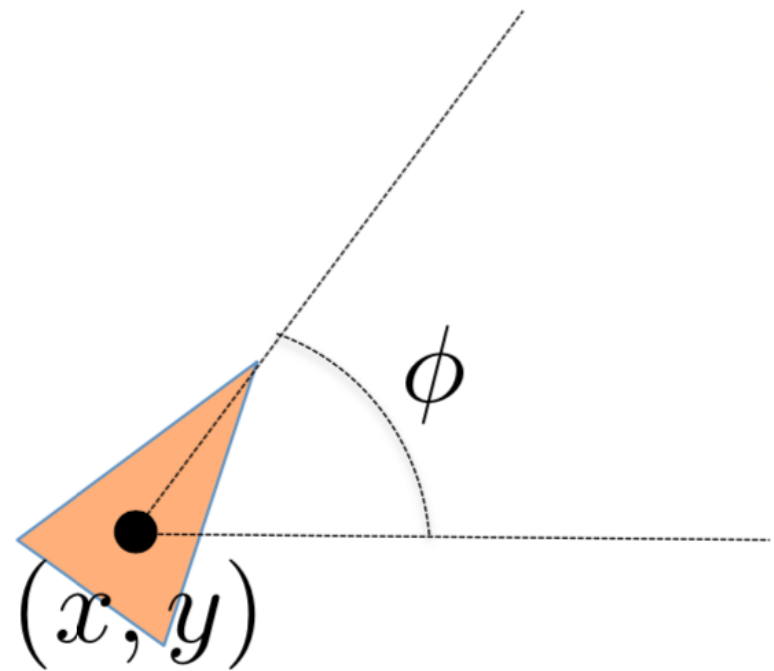
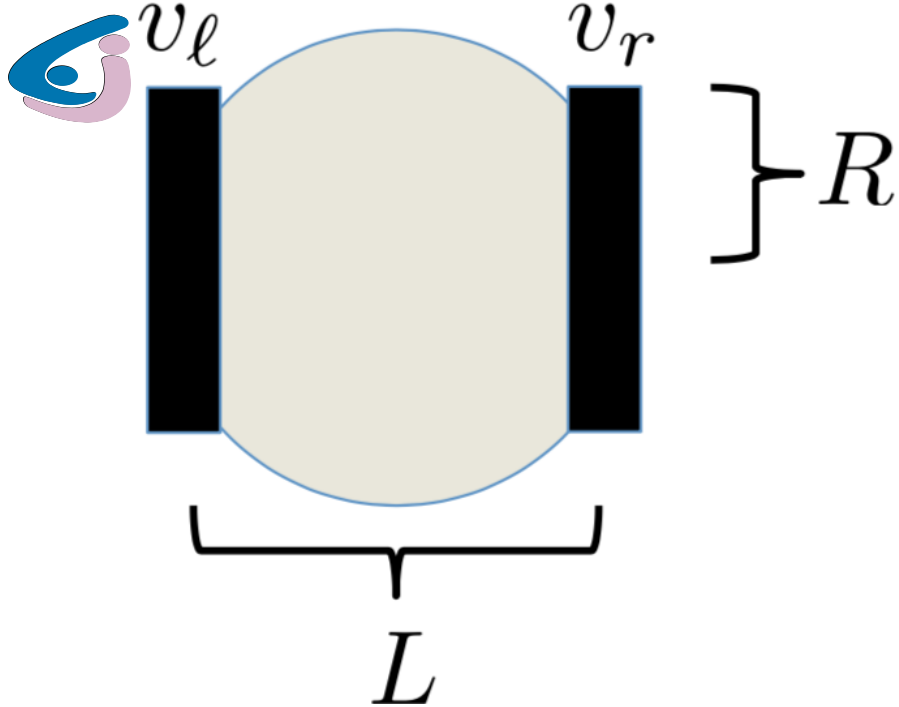




Modelo Uniciclo

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$$\dot{x} = \frac{R}{2} (v_r + v_l) \cos \phi$$

$$\dot{y} = \frac{R}{2} (v_r + v_l) \sin \phi$$

$$\dot{\phi} = \frac{R}{L} (v_r - v_l)$$

$$\dot{x} = v \cos \phi$$

$$\dot{y} = v \sin \phi$$

$$\dot{\phi} = \omega$$



$$v = \frac{R}{2}(v_r + v_\ell) \Rightarrow \frac{2v}{R} = v_r + v_\ell$$

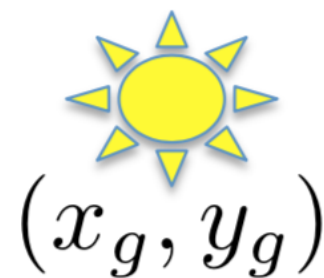
$$\omega = \frac{R}{L}(v_r - v_\ell) \Rightarrow \frac{\omega L}{R} = v_r - v_\ell$$

$$v_r = \frac{2v + \omega L}{2R}$$

$$v_\ell = \frac{2v - \omega L}{2R}$$



$$\begin{aligned}\dot{x} &= v_0 \cos \phi \\ \dot{y} &= v_0 \sin \phi \\ \dot{\phi} &= \omega\end{aligned}$$



$$e = \phi_d - \phi$$

$$\omega = \text{PID}(e)$$

$$\phi_d = \arctan \left(\frac{y_g - y}{x_g - x} \right)$$

