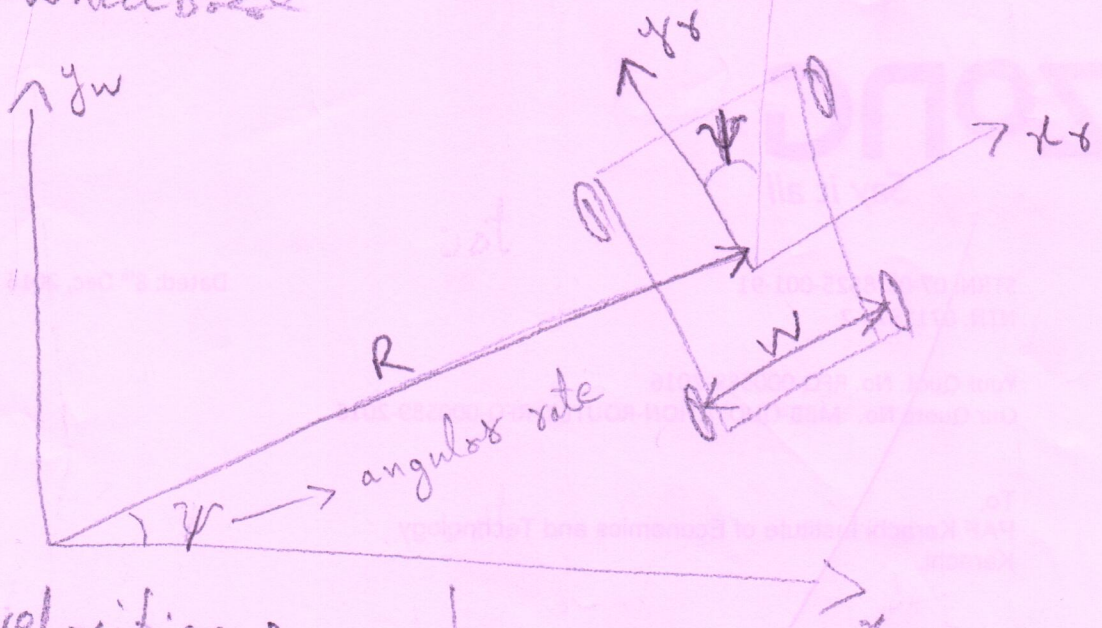
Robot Equations.

W -> Wheelbase



Robot velocities:

$$v_x = 0$$

$$v_y = \frac{v_r + v_l}{2}$$

$$\dot{\psi} = \frac{v_r - v_l}{W}$$

→ in world x_w co-ordinates

$$v_x = -\frac{v_r + v_l}{2} \sin(\psi)$$

$$v_y = \frac{v_r + v_l}{2} \cos(\psi)$$

$$\dot{\psi} = \frac{v_r - v_l}{W}$$

We consider that velocities dont change instantenously. $\dot{v}_r = u_1$, $\dot{v}_l = u_2$

$$x((k+1)T) = x(kT) - T \times \frac{(v_r(kT) + v_l(kT))}{2} \times \sin(\psi(kT))$$

$$y((k+1)T) = y(kT) + T \times \frac{(v_r(kT) + v_l(kT))}{2} \times \cos(\psi(kT))$$

$$\psi((k+1)T) = \psi(kT) + T \times \frac{(v_r(kT) - v_l(kT))}{W}$$

$$v_r((k+1)T) = v_r(kT) + T u_1(kT)$$

$$v_l((k+1)T) = v_l(kT) + T u_2(kT)$$

$k = 1, 2, 3, \ldots\ldots$
T = Time