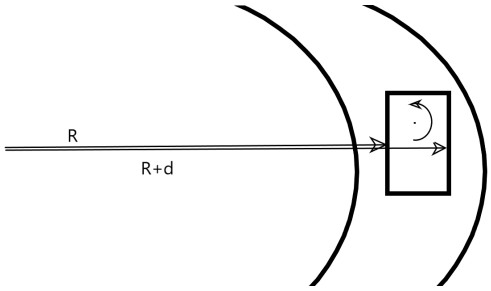
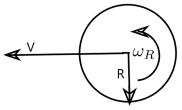
# AGV Encoders IMU

## 1 Mathematical Model




r → Radius of Wheels
d →Distance Between Wheels
R → Radius of turn
$\omega$ →Angular Velocity of car
$\omega_L$ →Angular Velocity of left Wheel
$\omega_R$ →Angular Velocity of Right Wheel

Now,
$V_R = \omega(R + d)$
$V_L = \omega R$
$\omega_R = \omega(R + d)/r$
$\omega_L = \omega(R)/r$
$\omega_R = \omega_L + \omega(d/r)$ → Equation 1




From IMU Readings we $g_L$ and $g_R$

$g_L = \sqrt{\omega_L^2 + \omega^2}$ → Equation 2
$g_R = \sqrt{\omega_R^2 + \omega^2}$ → Equation 3

Now by using equation 1,equation 2 and equation 3, We can find out $\omega_R$, $\omega_L$,$\omega$