

Motion Models

$$\dot{\theta} = 0$$

Yaw rate

$$x_f = x_0 + v(dt)(\cos(\theta_0))$$

Final x position Initial x position Velocity Time elapsed X-component of velocity

$$y_f = y_0 + v(dt)(\sin(\theta_0))$$

Final y position Initial y position Velocity Time elapsed Y-component of velocity

$$\theta_f = \theta_0$$

Final yaw Initial yaw

$$\dot{\theta} \neq 0$$

Yaw rate

$$x_f = x_0 + \frac{v}{\dot{\theta}} [\sin(\theta_0 + \dot{\theta}(dt)) - \sin(\theta_0)]$$

Final x position Initial x position Velocity Yaw rate Initial yaw Yaw rate Time elapsed Initial yaw

$$y_f = y_0 + \frac{v}{\dot{\theta}} [\cos(\theta_0) - \cos(\theta_0 + \dot{\theta}(dt))]$$

Final y position Initial y position Velocity Yaw rate Initial yaw Initial yaw Yaw rate Time elapsed

$$\theta_f = \theta_0 + \dot{\theta}(dt)$$

Final yaw Initial yaw Yaw rate Time elapsed