

Kinematic calculations for mobile robots

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1 Three wheel omnidirectional robot

$$h_1(0)V_b = \frac{1}{r_i} \begin{bmatrix} 1 & \tan \gamma_i \end{bmatrix} \begin{bmatrix} \cos \beta_i & \sin \beta_i \\ \sin \beta_i & \cos \beta_i \end{bmatrix} V_b \quad (1)$$

$$\gamma_1 = 0, \beta_1 = 0 \quad (2)$$

$$= \frac{1}{r_i} \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} \cos 0 & \sin 0 \\ \sin 0 & \cos 0 \end{bmatrix} V_b \quad (3)$$

$$= \frac{1}{r_i} \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} V_b \quad (4)$$