Ground Robot UKF

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1 Design

1.1 State Vector

$$\mathbf{x}_t = \textbf{\textcolor{red}{?}} \tag{1}$$

1.2 Prediction Step

1.2.1 Control Input

$$\mathbf{u}_t = \begin{bmatrix} \ddot{y}^b \\ \psi \end{bmatrix} \tag{2}$$

1.2.2 State Transition Function

$$g(\mathbf{x}_{t-\Delta t}, \mathbf{u}_t, \Delta t) = \textbf{\textcolor{red}{?}} \tag{3}$$

1.3 Measurement Update Step

1.3.1 Measurement Vector

$$\mathbf{z}_t = \begin{bmatrix} r \end{bmatrix} \tag{4}$$

1.3.2 Measurement Function

$$h(\bar{\mathbf{x}}_t) = \textbf{\textcolor{red}{?}} \tag{5}$$