EKF SLAM.

$$\bar{\mu}_t = A\mu_{t-1} + Bu_t.$$

$$\bar{\Sigma}_t = A\Sigma_{t-1}A^T + R_t.$$

$$K_t = \bar{\Sigma}_t H_t' \left(H_t \bar{\Sigma}_t H_t' + Q_t\right)^{-1}.$$

$$\mu_t = \bar{\mu}_t + K_t\left(y - h_f(\bar{\mu}_f)\right).$$

$$\Sigma_t = (I - K_t H_t)\bar{\Sigma}_t.$$

Bar matrix.

For all non known use $Q_{t_{2\times 2}} \begin{bmatrix} 0.1 & 0 \\ 0 & 0.1 \end{bmatrix}$.

for known. use $d_t \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

For motion use. $\begin{bmatrix} 0.02 & 0 & 0 \\ 0 & 0.02 & 0 \\ 0 & 0 & 0.002 \end{bmatrix}$