

Initial estimates for \hat{x}_k^- and P_k^-

Time Update ("Predict")

- (1) Project the state ahead

$$\hat{x}_{k+1}^- = f(\hat{x}_k, u_k, 0)$$

- (2) Project the error covariance ahead

$$P_{k+1}^- = A_k P_k A_k^T + W_k Q_k W_k^T$$

Measurement Update ("Correct")

- (1) Compute the Kalman gain

$$K_k = P_k^- H_k^T (H_k P_k^- H_k^T + V_k R_k V_k^T)^{-1}$$

- (2) Update estimate with measurement z_k

$$\hat{x}_k = \hat{x}_k^- + K(z_k - h(\hat{x}_k^-, 0))$$

- (3) Update the error covariance

$$P_k = (I - K_k H_k) P_k^-$$