$$\hat{x}_k^- = A\hat{x}_{k-1} + Bu_{k-1} \tag{0.0.1}$$

$$P_k^- = AP_{k-1}A^T + BQB^T \tag{0.0.2}$$

$$K_k = P_k^- H^T (HP_k^- H^T + R)^- \tag{0.0.3}$$

$$\hat{x}^k = \hat{x}_k^- + K_k(z_k - H\hat{x}_k^-) \tag{0.0.4}$$

$$P_k = (I - K_k H)P_k^- \tag{0.0.5}$$

$$C_{v_k^-} = \frac{1}{N}\sum_{j=k-N+1}^{k} v_j^-(v_j^-)^T$$

$$(v_j^- = z_j - H_j x_j^-) \tag{0.0.6}$$

$$\hat{R}_k = C_{v_k^-} - H_k P_k^- H_k^T \tag{0.0.7}$$

$$\hat{Q}_k = \frac{1}{N}\sum_{j=k-N+1}^{k} \Delta x_j \Delta x_j^T + P_k^+ - \Phi P_{k-1}^+ \Phi^T$$

$$(\Delta x_j = x_j^- - x_j^+) \tag{0.0.8}$$

$$f_n(z_k) = \frac{1}{\sqrt{(2\pi)^m |C_{v_k^-}|}} e^{-\frac{1}{2} v_k C_{v_k^-}^{-1} v_k^T} \tag{0.0.9}$$

$$p_n(k) = \frac{f_n(z_k) \cdot p_n(k-1)}{\sum_{j=1}^{N} f_j(z_k) \cdot p_j(k-1)} \tag{0.0.10}$$