

continued from the previous page	
13:	$\hat{z}_t^k = \begin{pmatrix} \sqrt{q_k} \\ \text{atan2}(\delta_{k,y}, \delta_{k,x}) - \bar{\mu}_{t,\theta} \\ \bar{\mu}_{k,s} \end{pmatrix}$
14:	$F_{x,k} = \begin{pmatrix} 1 & 0 & 0 & 0 \cdots 0 & 0 & 0 & 0 & 0 \cdots 0 \\ 0 & 1 & 0 & 0 \cdots 0 & 0 & 0 & 0 & 0 \cdots 0 \\ 0 & 0 & 1 & 0 \cdots 0 & 0 & 0 & 0 & 0 \cdots 0 \\ 0 & 0 & 0 & 0 \cdots 0 & 1 & 0 & 0 & 0 \cdots 0 \\ 0 & 0 & 0 & 0 \cdots 0 & 0 & 1 & 0 & 0 \cdots 0 \\ 0 & 0 & 0 & 0 \cdots 0 & 0 & 0 & 1 & 0 \cdots 0 \end{pmatrix}$
15:	$H_t^k = \frac{1}{q_k} \begin{pmatrix} -\sqrt{q_k} \delta_{k,x} & -\sqrt{q_k} \delta_{k,y} & 0 & \sqrt{q_k} \delta_{k,x} & \sqrt{q_k} \delta_{k,y} & 0 \\ \delta_{k,y} & -\delta_{k,x} & -1 & -\delta_{k,y} & \delta_{k,x} & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{pmatrix} F_{x,k}$
16:	$\Psi_k = H_t^k \bar{\Sigma}_t [H_t^k]^T + Q_t$
17:	$\pi_k = (z_t^i - \hat{z}_t^k)^T \Psi_k^{-1} (z_t^i - \hat{z}_t^k)$
18:	<i>endfor</i>
19:	$\pi_{N_t+1} = \alpha$
20:	$j(i) = \underset{k}{\text{argmin}} \pi_k$
21:	$N_t = \max\{N_t, j(i)\}$
22:	$K_t^i = \bar{\Sigma}_t [H_t^{j(i)}]^T \Psi_{j(i)}^{-1}$
23:	$\bar{\mu}_t = \bar{\mu}_t + K_t^i (z_t^i - \hat{z}_t^{j(i)})$
24:	$\bar{\Sigma}_t = (I - K_t^i H_t^{j(i)}) \bar{\Sigma}_t$
25:	<i>endfor</i>
26:	$\mu_t = \bar{\mu}_t$
27:	$\Sigma_t = \bar{\Sigma}_t$
28:	<i>return</i> μ_t, Σ_t

Table 10.2 The EKF SLAM algorithm with ML correspondences, shown here with outlier rejection.