

<i>continued from the previous page</i>	
7:	add $\begin{pmatrix} -G_t^T \\ 1 \end{pmatrix} R_t^{-1} \begin{pmatrix} -G_t \\ 1 \end{pmatrix}$ to Ω at x_t and x_{t-1}
8:	add $\begin{pmatrix} -G_t^T \\ 1 \end{pmatrix} R_t^{-1} [\hat{x}_t - G_t \mu_{t-1}]$ to ξ at x_t and x_{t-1}
9:	endfor
10:	for all measurements z_t do
11:	$Q_t = \begin{pmatrix} \sigma_r & 0 & 0 \\ 0 & \sigma_\phi & 0 \\ 0 & 0 & \sigma_s \end{pmatrix}$
12:	for all observed features $z_t^i = (r_t^i \phi_t^i s_t^i)^T$ do
13:	$j = c_t^i$
14:	$\delta = \begin{pmatrix} \delta_x \\ \delta_y \end{pmatrix} = \begin{pmatrix} \mu_{j,x} - \mu_{t,x} \\ \mu_{j,y} - \mu_{t,y} \end{pmatrix}$
15:	$q = \delta^T \delta$
16:	$\hat{z}_t^i = \begin{pmatrix} \sqrt{q} \\ \text{atan2}(\delta_y, \delta_x) - \mu_{t,\theta} \end{pmatrix}$
17:	$H_t^i = \frac{1}{q} \begin{pmatrix} \sqrt{q}\delta_x & -\sqrt{q}\delta_y & 0 & -\sqrt{q}\delta_x & \sqrt{q}\delta_y & 0 \\ \delta_y & \delta_x & -1 & -\delta_y & -\delta_x & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{pmatrix}$
18:	add $H_t^{iT} Q_t^{-1} H_t^i$ to Ω at x_t and m_j
19:	add $H_t^{iT} Q_t^{-1} [z_t^i - \hat{z}_t^i + H_t^i \begin{pmatrix} \mu_{t,x} \\ \mu_{t,y} \\ \mu_{t,\theta} \\ \mu_{j,x} \\ \mu_{j,y} \\ \mu_{j,s} \end{pmatrix}]$ to ξ at x_t and m_j
20:	endfor
21:	endfor
22:	return Ω, ξ

Table 11.2 Calculation of Ω and ξ in GraphSLAM.