

input : Tracks updated using component update algorithm, marginal probability estimates $\tilde{p}^i(a)$.
output: Re-formed, single hypothesis tracks, each comprising existence probability $r_{t|t}^i$, state estimate $\bar{x}_{t|t}^i$, and covariance $\mathbf{P}_{t|t}^i$.

1 *Generate legacy (missed detection) tracks*

2 **for** $i \in \{1, \dots, n_{t|t-1}\}$ **do**

3 $r_{t|t}^i := \tilde{p}^i(0)r_{t|t}^{i,0}; \bar{x}_{t|t}^i := \bar{x}_{t|t}^{i,0}; \mathbf{P}_{t|t}^i := \mathbf{P}_{t|t}^{i,0}$

4 **end**

5 *Generate updated tracks for each measurement*

6 **for** $j \in \{1, \dots, m_t\}$ **do**

7 $i := n_{t|t-1} + j$

8 $r_{t|t}^i := \tilde{p}^i(1)r_{t|t}^{i,1} + \sum_{i'=1}^{n_{t|t-1}} \tilde{p}^{i'}(j)r_{t|t}^{i',j}$

9 $\bar{x}_{t|t}^i := \frac{1}{r_{t|t}^i} \left[\tilde{p}^i(1)r_{t|t}^{i,1}\bar{x}_{t|t}^{i,1} + \sum_{i'=1}^{n_{t|t-1}} \tilde{p}^{i'}(j)r_{t|t}^{i',j}\bar{x}_{t|t}^{i',j} \right]$

10 $\mathbf{P}_{t|t}^i :=$

$$\frac{1}{r_{t|t}^i} \left\{ \tilde{p}^i(1)r_{t|t}^{i,1} [\mathbf{P}_{t|t}^{i,1} + (\bar{x}_{t|t}^{i,1} - \bar{x}_{t|t}^i)(\bar{x}_{t|t}^{i,1} - \bar{x}_{t|t}^i)^T] + \sum_{i'=1}^{n_{t|t-1}} \tilde{p}^{i'}(j)r_{t|t}^{i',j} [\mathbf{P}_{t|t}^{i',j} + (\bar{x}_{t|t}^{i',j} - \bar{x}_{t|t}^i)(\bar{x}_{t|t}^{i',j} - \bar{x}_{t|t}^i)^T] \right\}$$

11 **end**