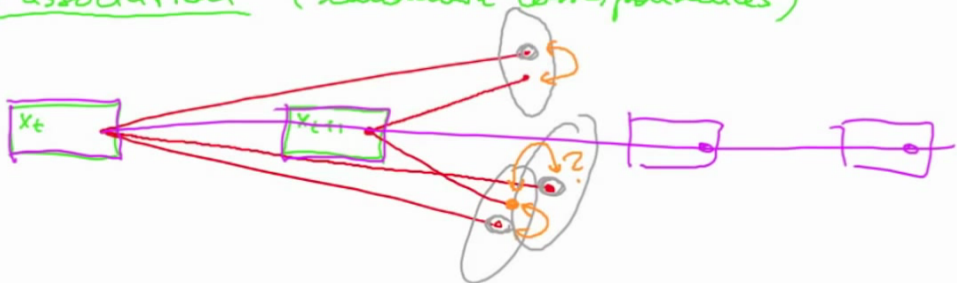
Data association (landmark correspondences)



$$p\left(X_{1:t},\, \text{Map} \mid Z_{1:t},\, U_{1:t},\, C_{1:t}\right) = p\left(\text{Map} \mid X_{1:t},\, Z_{1:t},\, U_{1:t},\, C_{1:t}\right)\, p\left(X_{1:t} \mid Z_{1:t},\, U_{1:t},\, C_{1:t}\right)$$

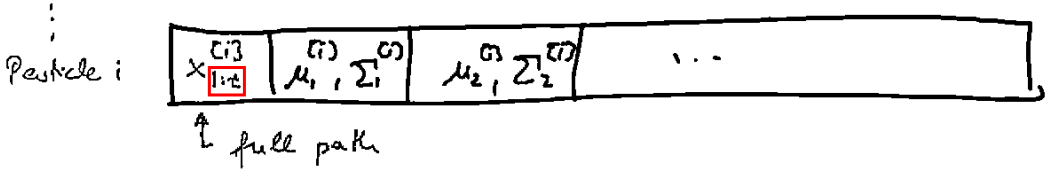
$$= \left(\prod_{j=1}^{N} p\left(\vec{p}_{W\,j} \mid X_{1:t},\, Z_{1:t},\, C_{1:t}\right)\right)\, p\left(X_{1:t} \mid Z_{1:t},\, U_{1:t},\, C_{1:t}\right)$$

- Each particle maintains individual data associations!
- FastSLAM maintains posterior over multiple data associations!

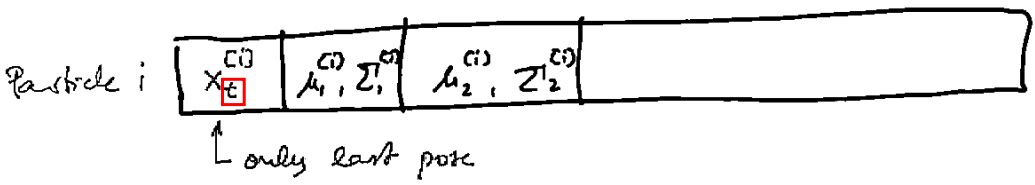
The term $\vec{p}_{W\,j} = \begin{pmatrix} x_{W\,j} \\ y_{W\,j} \end{pmatrix}$

$j = 1, \ldots, N$, represents the random coordinates of the registered world landmark number j within the state vector $\vec{x}_t$.

FastSLAM solves full SLAM problem ...



... and the online SLAM problem!



⇒ So we use it as a filter!