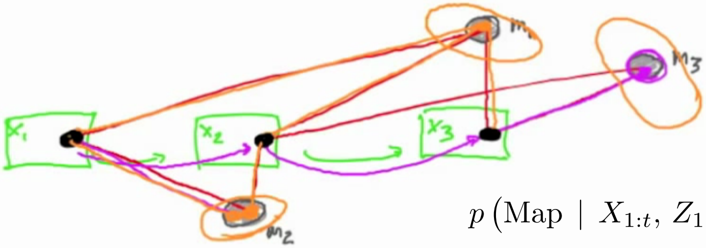
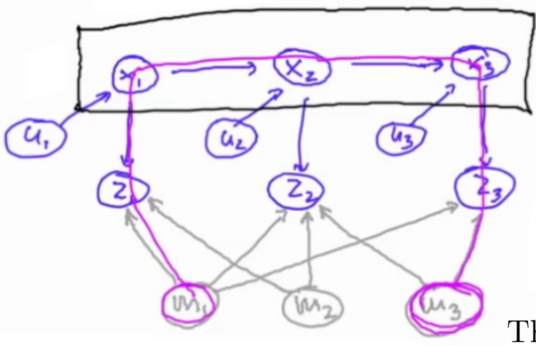


$$p\left(\mathrm{Map} \mid X_{1:t},\, Z_{1:t},\, U_{1:t}\right) = \prod_{j=1}^{N} p\left(\vec{p}_{W\,j} \mid X_{1:t},\, Z_{1:t}\right)$$

Dynamic Bayes network generated from the above process



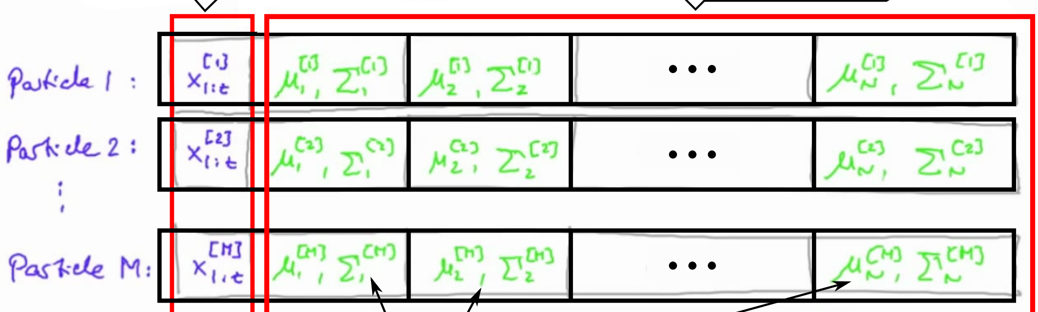
The term $\vec{p}_{W\,j} = \begin{pmatrix} x_{W\,j} \\ y_{W\,j} \end{pmatrix}$

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

The index where the random x coordinate for the registered world landmark $j, x_{W\,j}$, is stored within the state vector $\vec{x}_t$ is:

$$i = 3 + 2\,j - 1$$

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



To represent the distribution of paths

Individual EKF, one for each different landmark that a particular particle observes

Fast-SLAM solves not only the FULL-SLAM problem but also the ONLINE-SLAM problem