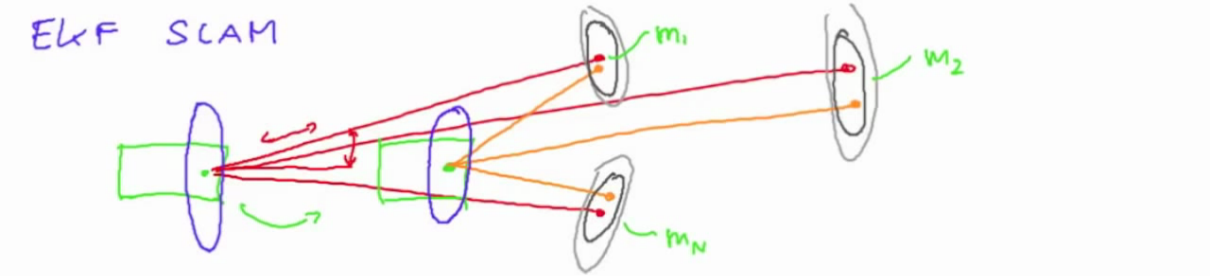

$$\vec{\mu}_t = \begin{pmatrix} \mu_{x_t} \\ \mu_{y_t} \\ \mu_{\theta_t} \\ \mu_{x_{L_1}} \\ \mu_{y_{L_1}} \\ \vdots \\ \mu_{x_{L_j}} \\ \mu_{y_{L_j}} \\ \vdots \\ \mu_{x_{L_N}} \\ \mu_{y_{L_N}} \end{pmatrix} \begin{matrix} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{matrix} \begin{matrix} 3 \\ \\ \\ \\ \\ \\ 2N \\ \\ \\ \\ \\ \end{matrix}$$

$$\Sigma_t = \begin{pmatrix} \sigma^2_{x_t} & \sigma_{x_t y_t} & \sigma_{x_t \theta_t} & 0 & 0 & \dots & 0 & 0 & \dots & 0 & 0 \\ \sigma_{x_t y_t} & \sigma^2_{y_t} & \sigma_{y_t \theta_t} & 0 & 0 & \dots & 0 & 0 & \dots & 0 & 0 \\ \sigma_{x_t \theta_t} & \sigma_{y_t \theta_t} & \sigma^2_{\theta_t} & 0 & 0 & \dots & 0 & 0 & \dots & 0 & 0 \\ 0 & 0 & 0 & \sigma^2_{x_{L_0}} & 0 & \dots & 0 & 0 & \dots & 0 & 0 \\ 0 & 0 & 0 & 0 & \sigma^2_{y_{L_0}} & \dots & 0 & 0 & \dots & 0 & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & 0 & 0 & 0 & \dots & \sigma^2_{x_{L_j}} & 0 & \dots & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \dots & 0 & \sigma^2_{y_{L_j}} & \dots & 0 & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & 0 & 0 & 0 & \dots & 0 & 0 & \dots & \sigma^2_{x_{L_N}} & 0 \\ 0 & 0 & 0 & 0 & 0 & \dots & 0 & 0 & \dots & 0 & \sigma^2_{y_{L_N}} \end{pmatrix} \begin{matrix} 3 \\ \\ \\ \\ \\ \\ 2N \\ \\ \\ \\ \\ \end{matrix}$$

3 $2N$

Landmarks' estimated coordinates

Landmarks' variances

In this lecture the robot observes landmarks whose positions are not given in advanced. The landmarks' positions are stocastic as well as the robot's pose.