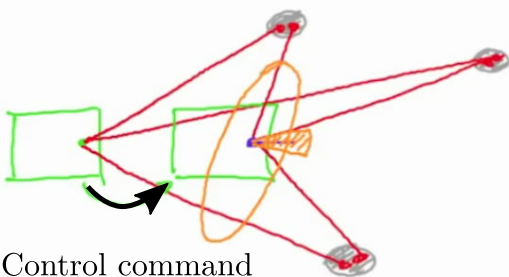# SLAM - Unit G: Particle Filter SLAM (FastSLAM).

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Control command

$$\vec{u}_t = \begin{pmatrix} l_t \\ r_t \end{pmatrix}$$

Extended Kalman Filter (EKF)

$$\mu_t = \begin{pmatrix} \mu_{x_t} \\ \mu_{y_t} \\ \mu_{\theta_t} \end{pmatrix} \quad \begin{array}{l} \text{Estimated state} \\ \text{or} \\ \text{corrected state} \end{array}$$

$$\Sigma_t = \begin{pmatrix} \sigma_{x_t}^2 & \sigma_{x_t y_t} & \sigma_{x_t \theta_t} \\ \sigma_{x_t y_t} & \sigma_{y_t}^2 & \sigma_{y_t \theta_t} \\ \sigma_{x_t \theta_t} & \sigma_{y_t \theta_t} & \sigma_{\theta_t}^2 \end{pmatrix}$$