

Probabilistic
Graphical
Models

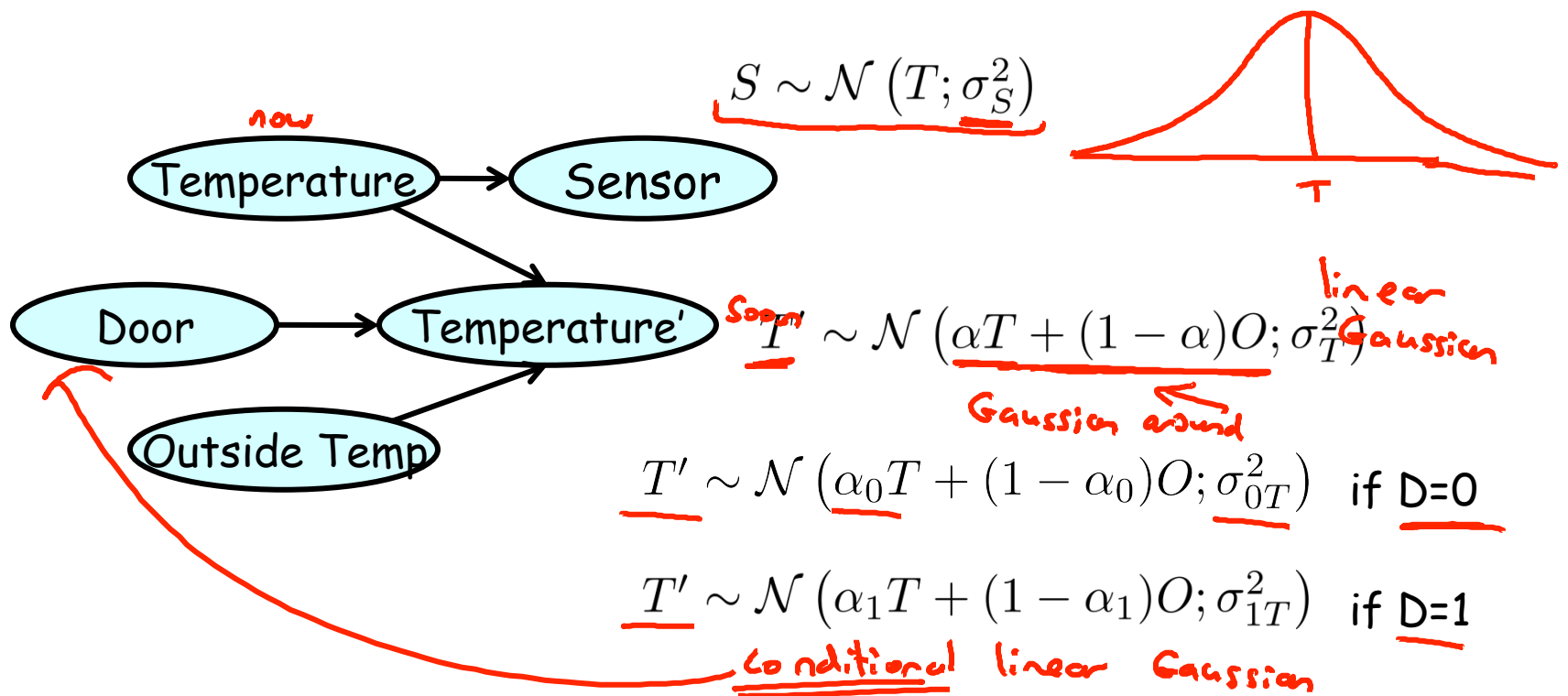


Representation

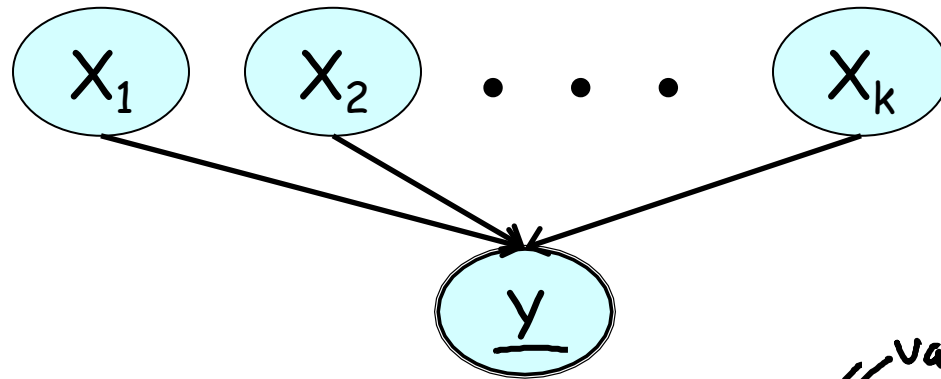
Local Structure

Continuous Variables

Continuous Variables



Linear Gaussian



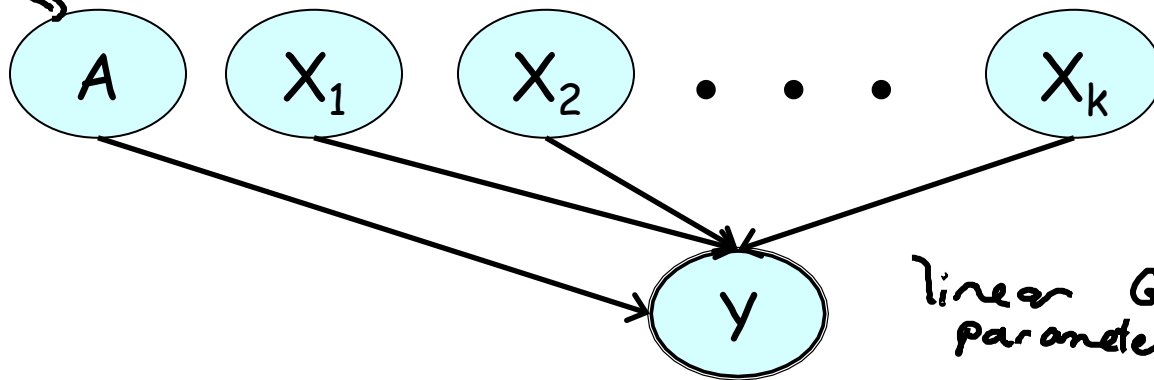
$$Y \sim \mathcal{N} \left(\underbrace{w_0 + \sum w_i X_i}_{\text{mean}}; \sigma^2 \right)$$

linear function of parents

variance doesn't depend on parents

Conditional Linear Gaussian

discrete

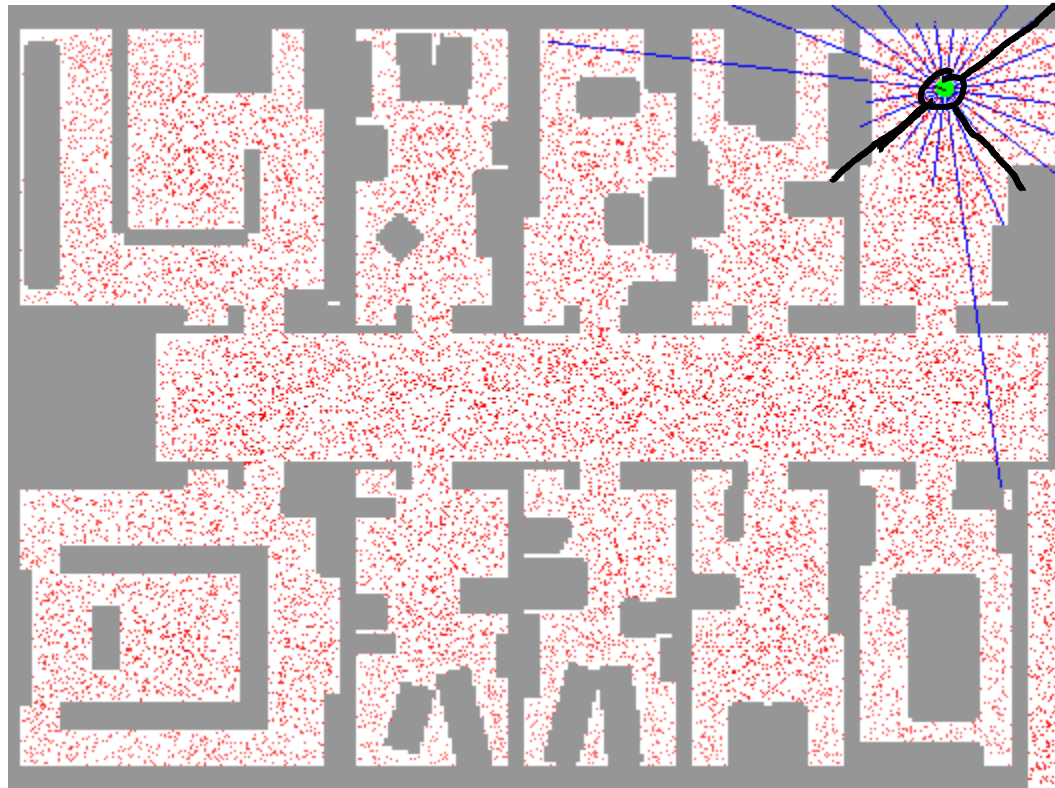


linear Gaussian whose parameters depend on A

$$Y \sim \mathcal{N}\left(\underline{w}_{a0} + \sum \underline{w}_{ai} X_i; \sigma_a^2\right)$$

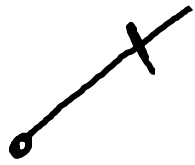
↑ variance can depend on A

Robot Localization

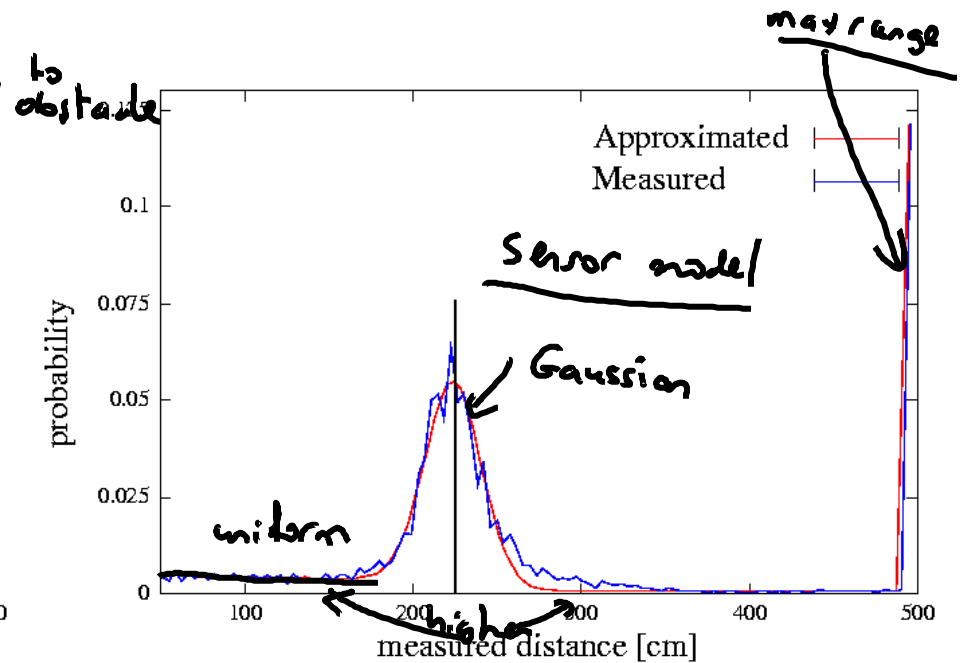
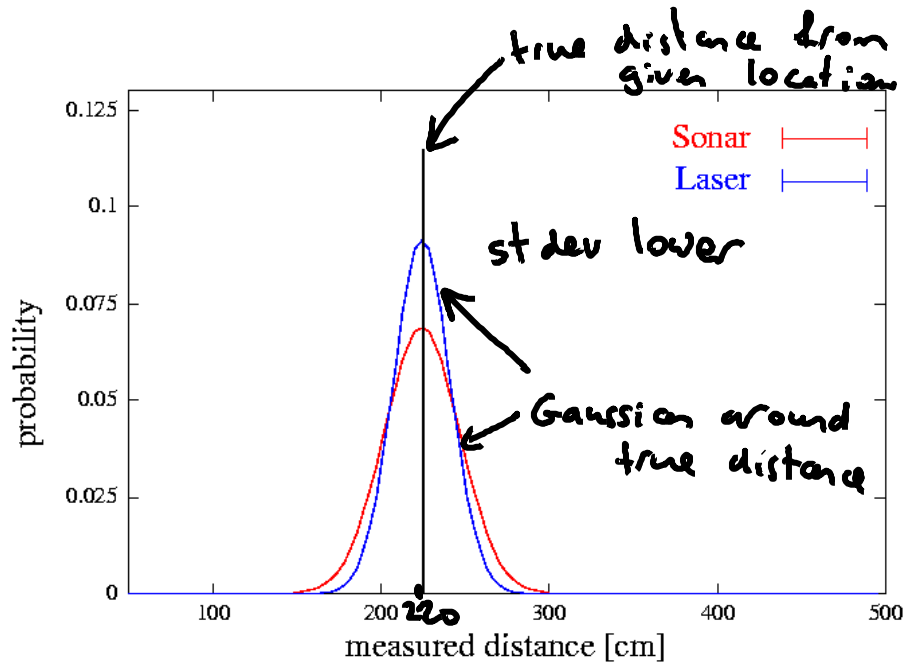


Fox, Burgard, Thrun

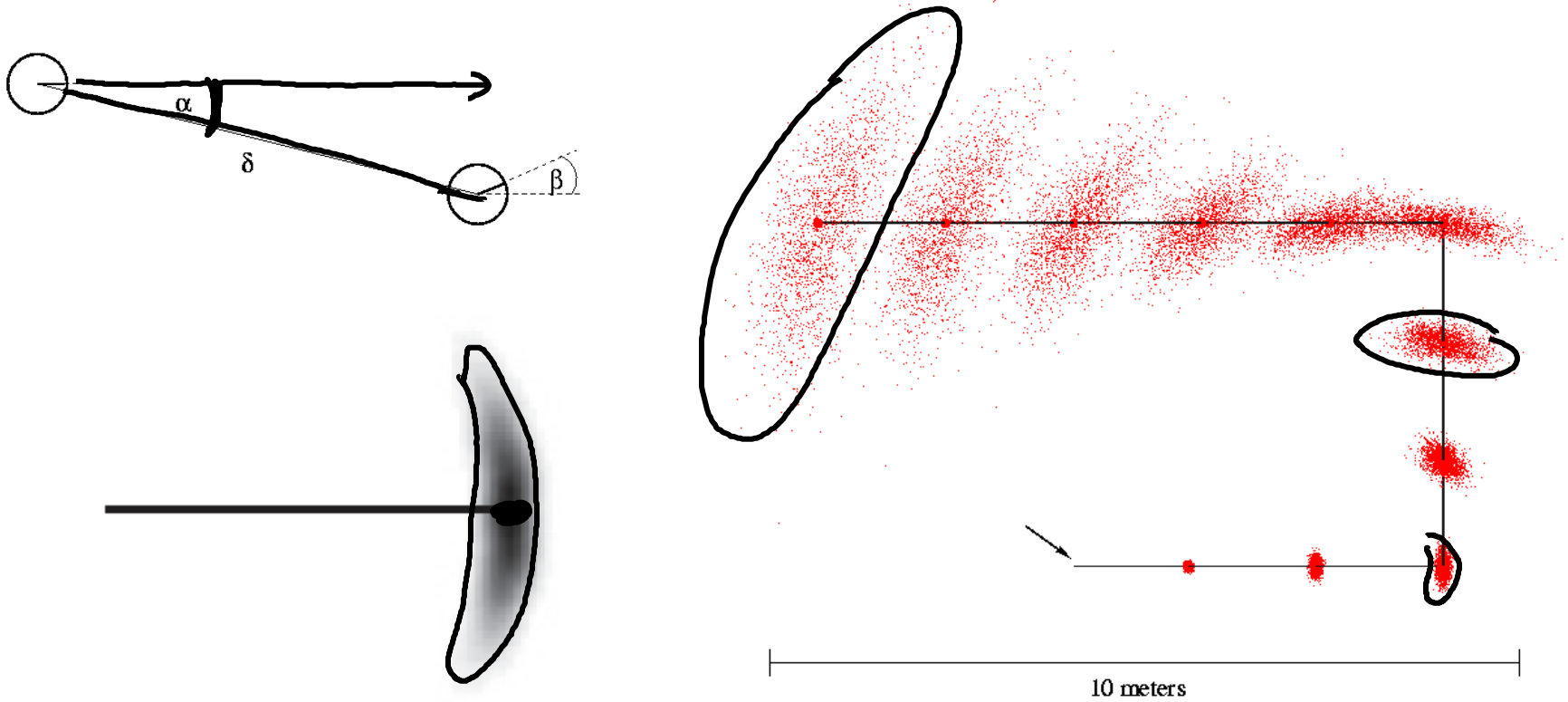
Daphne Koller



Nonlinear Gaussians



Robot Motion Model



Fox, Burgard, Thrun

Daphne Koller