

Explanation for Step 3 in Slide 7

$$\begin{aligned} & p(y_k, Y_{k-1} | x_k) \\ &= \frac{p(y_k \cap Y_{k-1} \cap x_k)}{p(x_k)} \times \frac{p(Y_{k-1} \cap x_k)}{p(Y_{k-1} \cap x_k)} \\ &= \frac{p(y_k \cap Y_{k-1} \cap x_k)}{p(Y_{k-1} \cap x_k)} \times \frac{p(Y_{k-1} \cap x_k)}{p(x_k)} \\ &= p(y_k | Y_{k-1}, x_k) \times p(Y_{k-1} | x_k) \end{aligned}$$

(Need the Prior prob. term later)

