

THREE TRICKS

CHAPTER 13

Three tricks we use

Bayes' rule:

$$\mathbf{P}(Y|X) = \frac{\mathbf{P}(X|Y)\mathbf{P}(Y)}{\mathbf{P}(X)} = \alpha\mathbf{P}(X|Y)\mathbf{P}(Y)$$

Marginalization:

$$\mathbf{P}(X) = \sum_y \mathbf{P}(X, Y = y)$$

Product rule:

$$\mathbf{P}(X, Y) = \mathbf{P}(X)\mathbf{P}(Y|X)$$

All 3 work with extra conditioning, e.g.:

$$\mathbf{P}(X|Z) = \sum_y \mathbf{P}(X, Y = y|Z)$$

$$\mathbf{P}(Y|X, Z) = \alpha\mathbf{P}(X|Y, Z)\mathbf{P}(Y|Z)$$