

Conditional Random Field

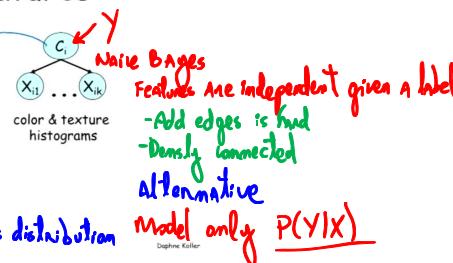
Task-specific prediction

We always have the
Same type of variables Always
The same type of problem

	X input vars	Y target vars
Image Segmentation	Pixel values Processed features	Class f. on every pixel, grass, sky, cow, water
Text Processing	words in sentence	Labels of words, person, location, organization

Correlated Features

Correlated Features



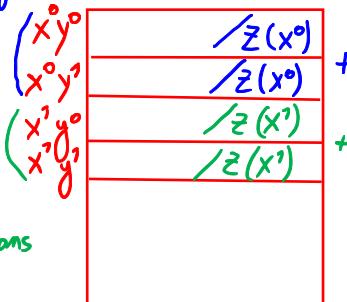
$$\tilde{P}_\Phi(X, Y) = \prod_{i=1}^K \phi_i(D_i)$$

unnormalized measure

$$z_\Phi(X) = \sum_Y \tilde{P}_\Phi(X, Y)$$

$$\tilde{P}_\Phi(Y|X) = \frac{1}{z_\Phi(X)} \tilde{P}_\Phi(X, Y)$$

family of conditional distributions



$$\Phi_i(X_i, Y) = \exp\{w_i \sum_i \{X_i = 1, Y = 1\}\} \quad \text{Logistic Model}$$