Markov and Conditional RF

- Markov / Conditional Random fields model conditional dependencies between random variables
- Each variable is conditionally independent of all other variables given its neighbours
- Posterior probability of the labelling *x* given data *D* is :

$$\Pr(\mathbf{x}|\mathbf{D}) = \frac{1}{Z}\exp(-\sum_{c\in\mathcal{C}}\psi_c(\mathbf{x}_c))$$

partition function — cliques — potential functions

- Energy of the labelling is defined as :

$$E(\mathbf{x}) = -\log\Pr(\mathbf{x}|\mathbf{D}) - \log Z = \sum_{c\in\mathcal{C}}\psi_c(\mathbf{x}_c)$$