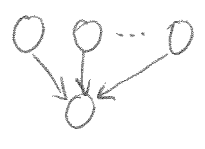


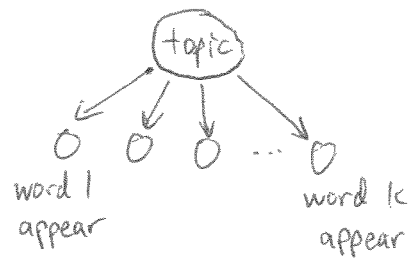
Goals of CSE 150

- Probabilistic reasoning under uncertainty
- How to discover compact representations of complex world?
- Balance power/expressiveness of model vs computational tractability

(1) Noisy-OR CPT

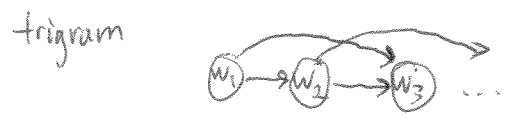


(2) Naive Bayes (doc. classification)

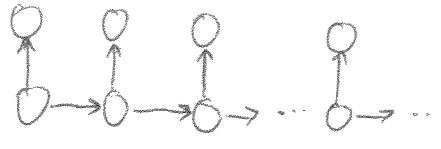


(3) Markov models of language

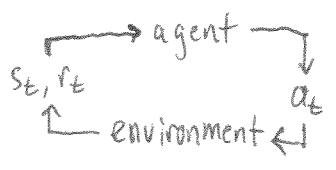
$w_l = l^{th}$ word in sentence



(4) HMMs for speech recognition

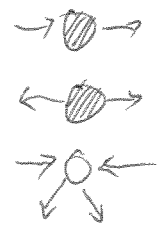


(5) MDPs for planning

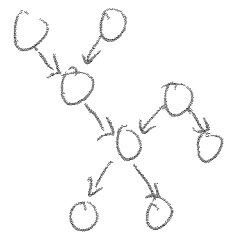


• What are efficient algorithms for automated forms of intelligence; reasoning, decision-making, ...

(1) conditional independence tests via d-separation



(2) polytree algorithm for inference



(4) dynamic programming in HMMs
 - Viterbi alg.
 - Forward/backward alg.

(3) EM algorithm for maximum likelihood estimation w/ guarantees of monotonic convergence

(5) Algorithms in MDPs
 - policy iteration
 - value iteration