Graph model connects tightly to the Markov model.

To decrease the dimension of the Markov chain xn = f(x_n-1,x_n-2, ...), researchers invent Hidden Markov Chain. (Idea of factorization)

Hidden Markov Chain is not necessary related to time series but has to related to sequence and connections. (dynamic relationship)

The traditional conditional probability model could be used in static problems (among features), eg: naive bayes.

Graph model != hierarchy structure. (cycle makes messy.)
DAG = hierarchy structure? (inclined to agree)

a->b, b->c, a->c.
Two application models:
    1) Emphasize on position/distance (genome example)
    2) Emphasize on accessibility/transitivity. (transmission example)

DAG vs tree structure.
    1) Multiple parents vs one parent
            a) Redundancy on the path (based on the application 2)
            b) Probability conservation on node (between parent and children)

Potential problem:
Level definition of complicated cases.

Special attention on:
    - Connection of Graph model and Markov Model (together with hidden Markov model)
    - Hot topic: CRF.