Systèmes de raisonnement probabilistes

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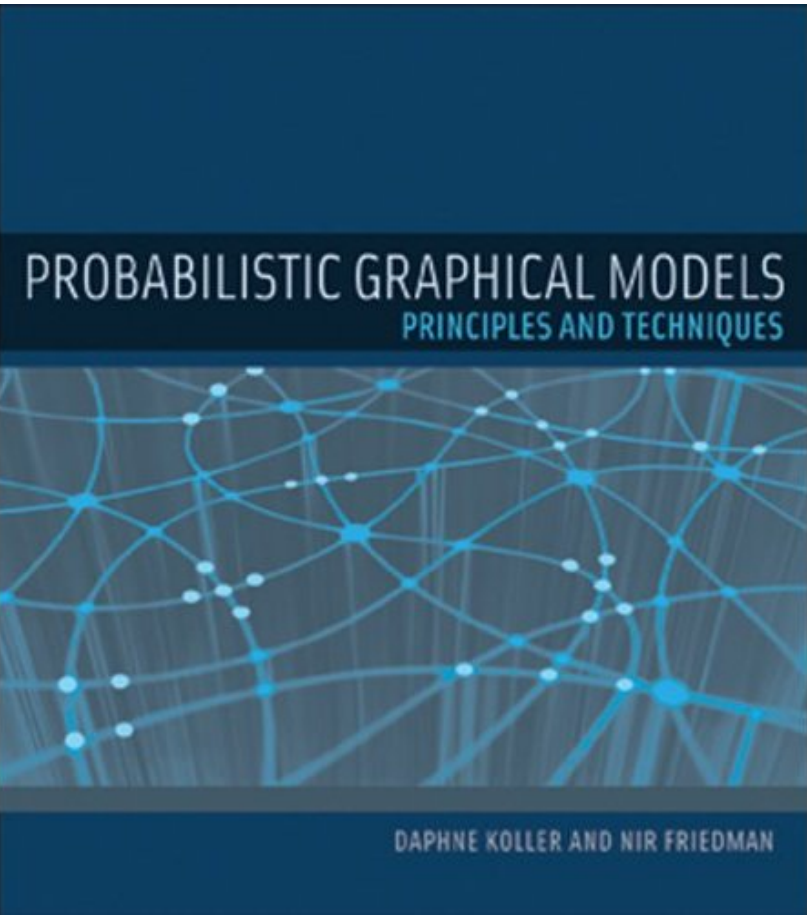
Fonctionnement

Organisation

- 8 séances de cours + 4 séances de TD
- 1 examen écrit
- 1 projet : synthèse d'un article scientifique applicatif

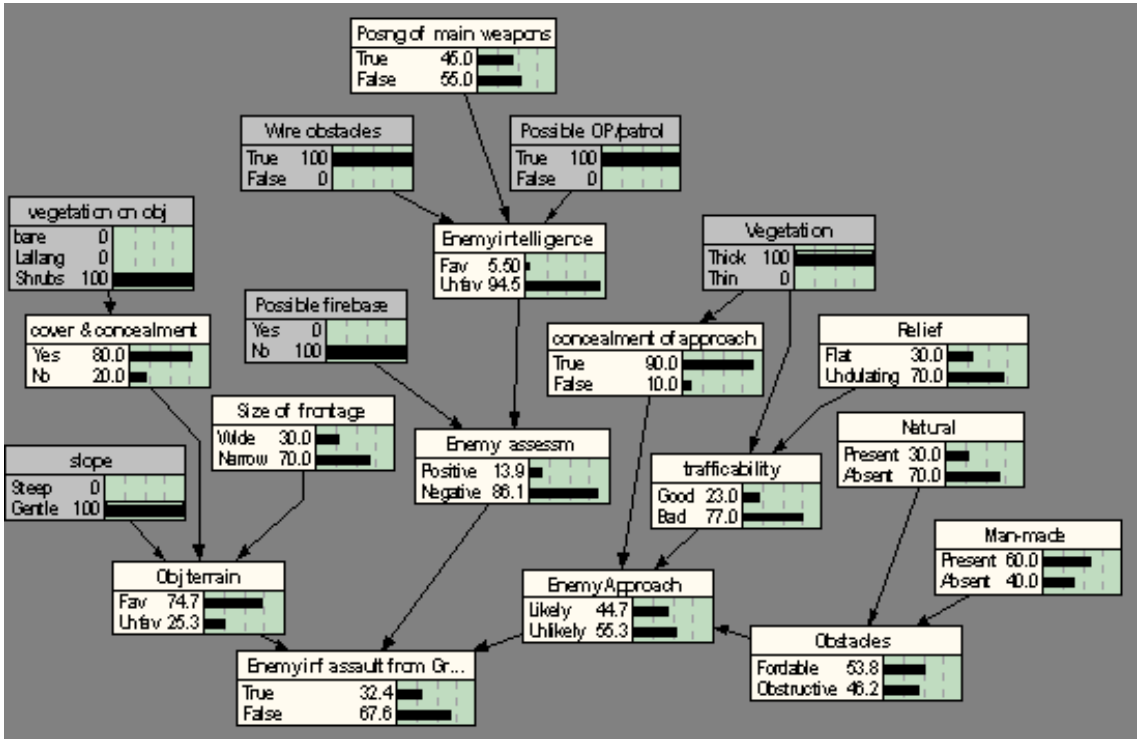
Introduction



Probabilistic Graphical Models

- Marriage between Graph theory and Probability theory
- Powerful framework for representing complex domains using probability distributions
- Numerous applications in machine learning, computer vision, natural language processing, computational biology, ...

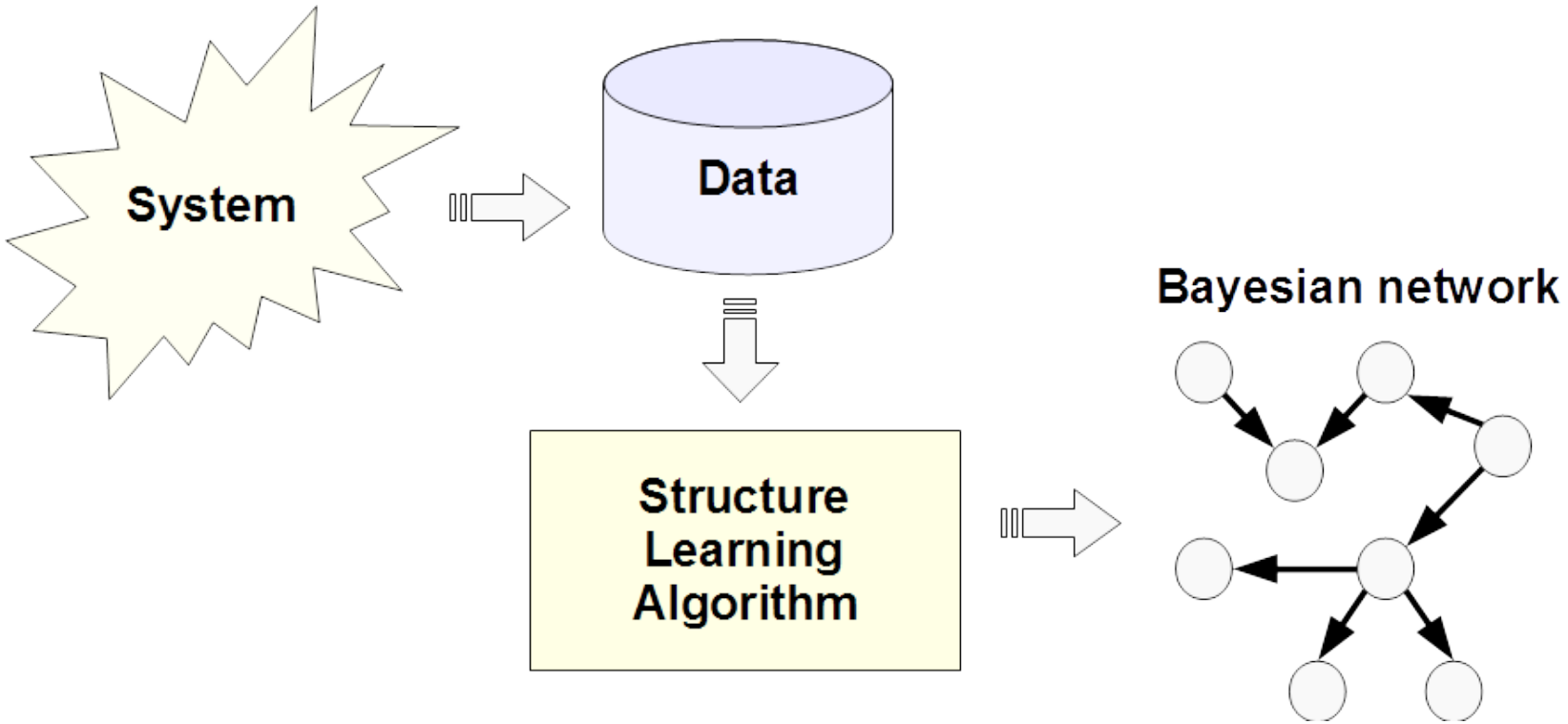
Bayesian networks for knowledge modeling ans reasoning



Advantages

- Modeling uncertain relationships
- Reasoning from incomplete observations

Bayesian networks for knowledge discovery

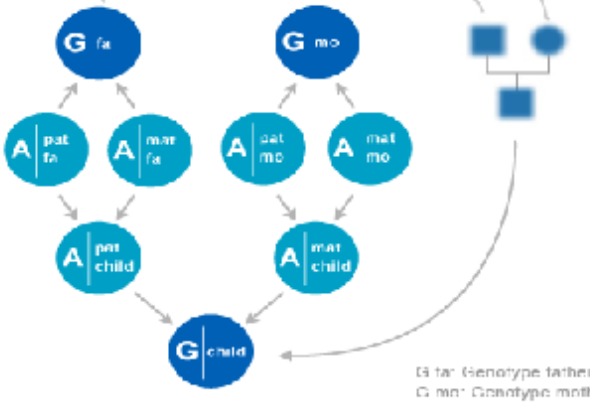


Advantages

- Structure learning from data
- Graphical interpretation

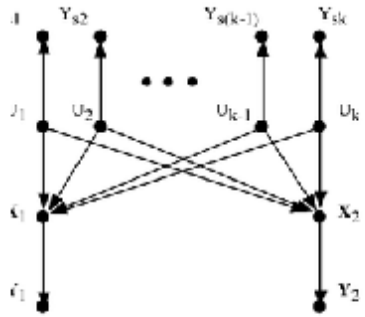
Bayesian networks applications

Victim identification system



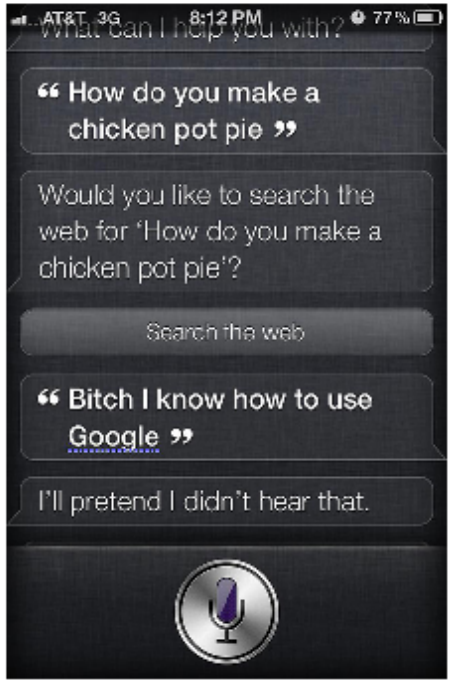
G fa: Genotype father
G mo: Genotype mother
G child: Genotype child
A pat: Paternal Mother Allele
A mat: Maternal Mother Allele

Turbo-codes (GSM, ...)

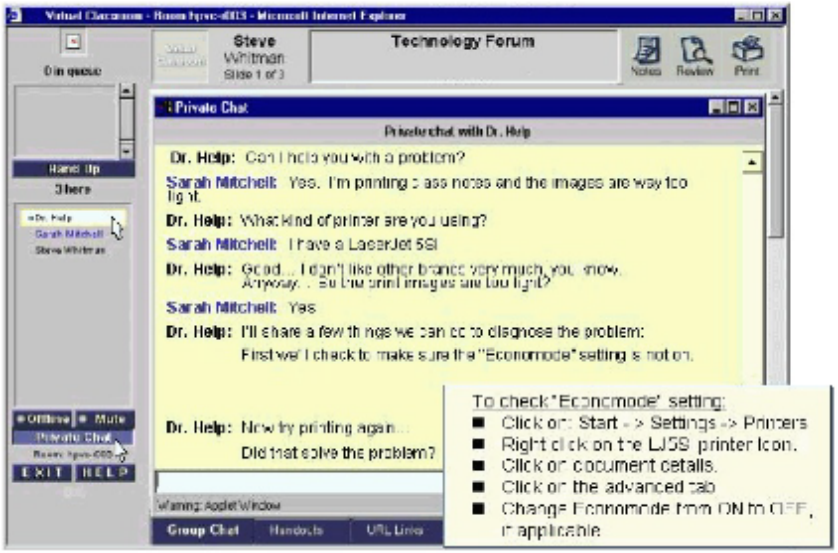


Anti Spam

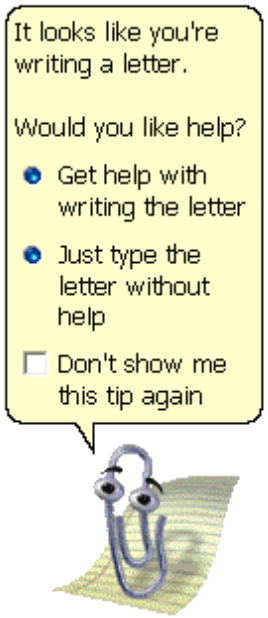
Assistant iPhone SIRI



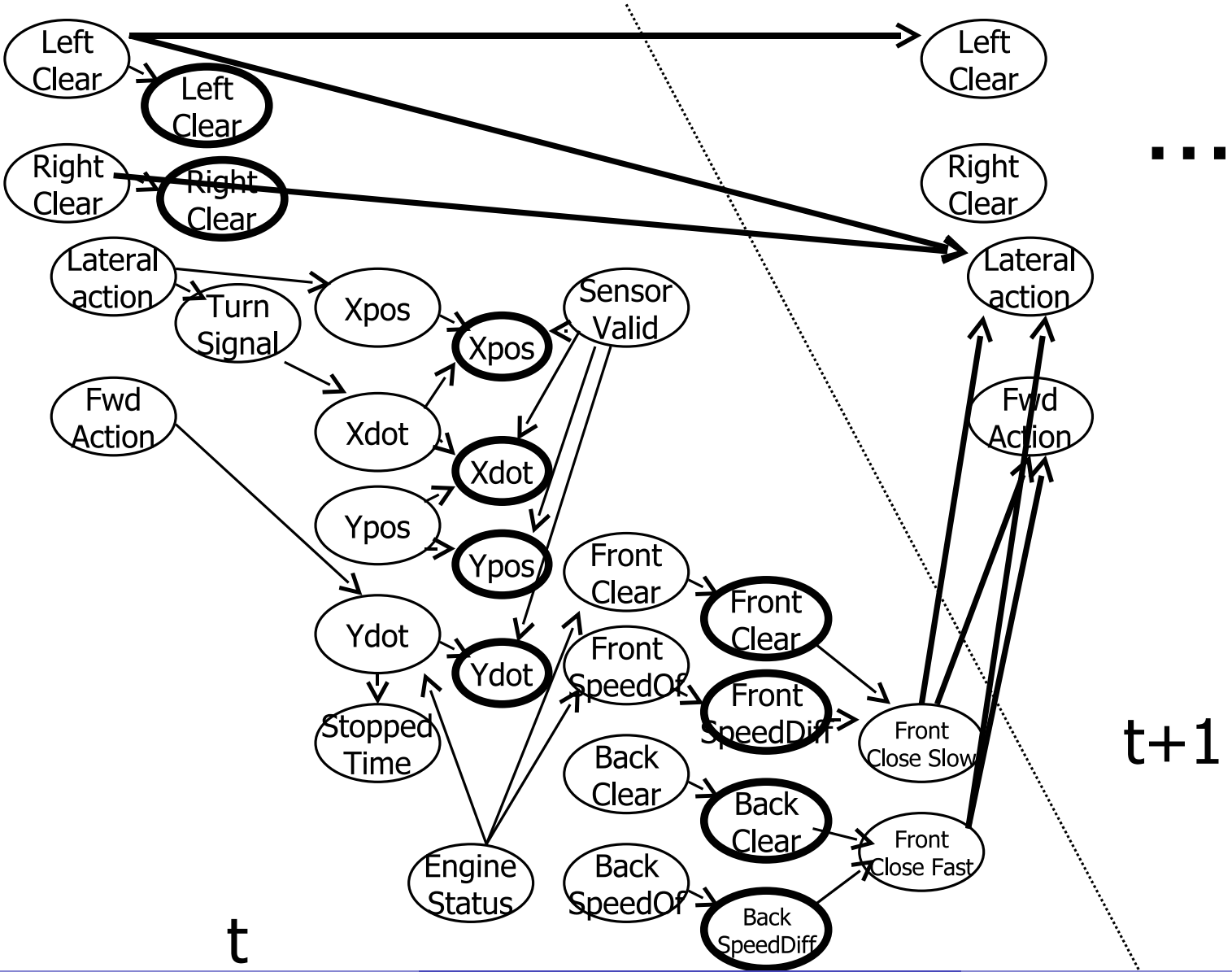
After-sale services



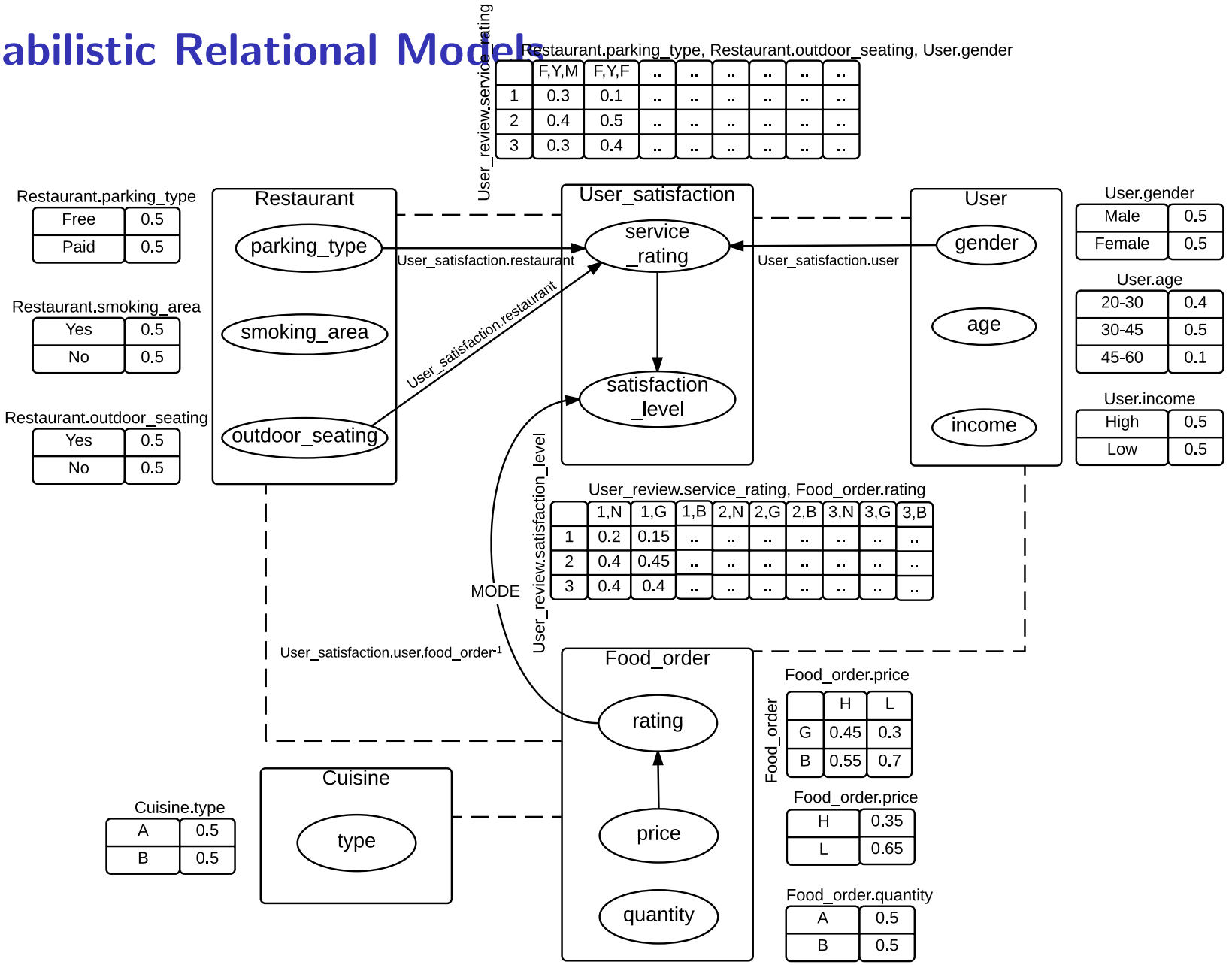
MS Office assistant



Dynamic Bayesian networks



Probabilistic Relational Model



Programme

Cours + TD/TP

- Rappels de probabilités
- Définition d'un réseau bayésien
- Raisonnement probabiliste
- Construction par expertise
- Apprentissage à partir de données
- Extension à des problèmes temporels
- Extension à des domaines relationnels

Un outil à installer

- Genie modeller