

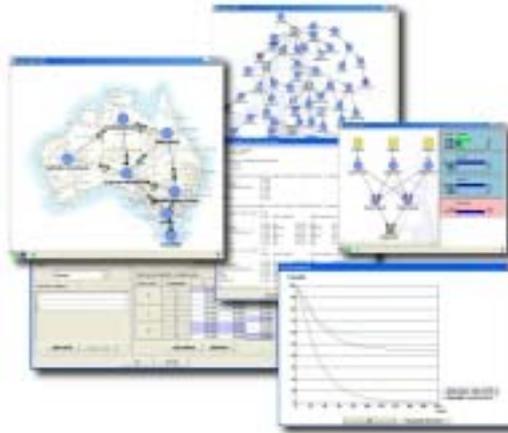


# Bayesian Network technology at your service

## Technical Specifications

- Exact or Approximate Inference
- Data Generation with MCMC
- JDBC/ODBC connection
- Automatic Discretization methods
- Complete processing of missing values and hidden variables
- Association Discovery (Structural learning)
- Bayesian Segmentation of data
  - Target node
- Characterization (targeted structural learning)
- Model Evaluation (lift and ROC curves, confusion matrix)
- Automatic node Positioning algorithms
- Arcs, target node, target state and evidence set analysis
- Automatic generation of HTML analysis reports
- Causal analysis (Essential and semi oriented graphs)
- Adaptive Questionnaires
  - Batch Data tagging
  - Dynamic Bayesian networks
- Direct action policies representation
- Reinforcement learning of action policies
  - Cross-platform (Java Technology)
- Multilingual English/French

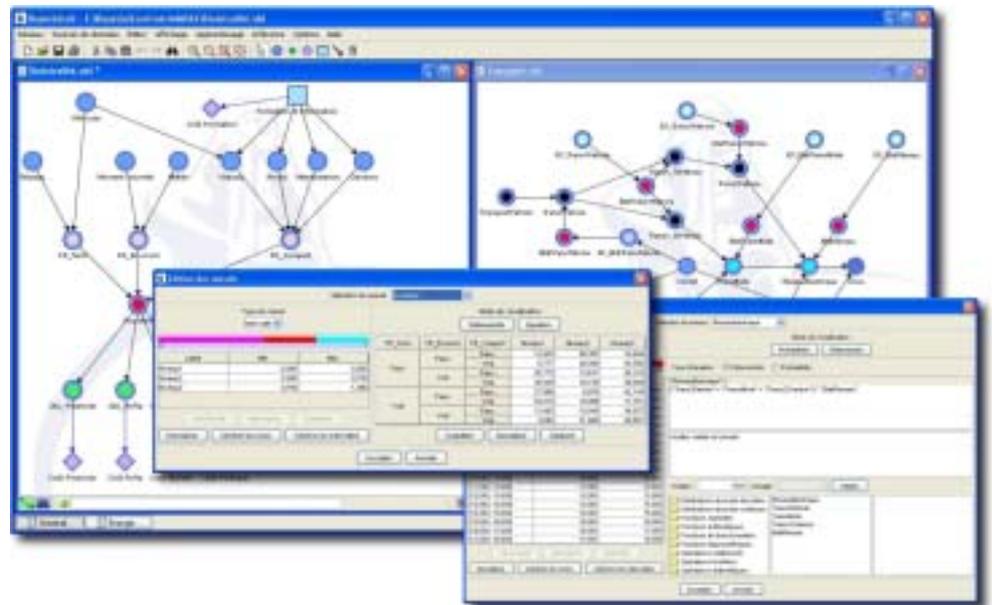
## BayesiaLab



*With BayesiaLab, Bayesia gives you a complete laboratory for manipulating Bayesian networks: develop your decision models through expertise and/or automatically from your data; quickly assimilate the represented knowledge using a set of original analytical tools; use the models in interactive mode or in batch, discover your optimal action policies by using reinforcement learning.*

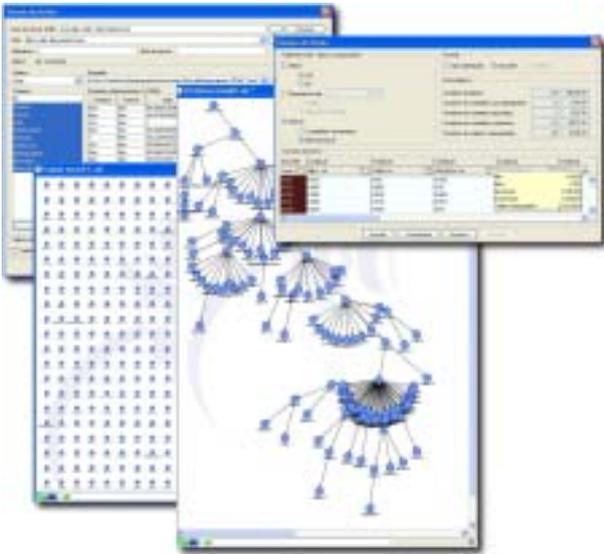
## Capitalize on your expertise and quantify your uncertainties

Through its ergonomic interface, BayesiaLab lets you easily formalize your knowledge in the form of Bayesian networks.



A very intuitive graphic development of the networks: creation of nodes with a simple click; creation of arcs with a simple drag; magnetic grid, alignment tools, and powerful layouting algorithms for a helpful assistance in positioning the nodes; arc inversion tools. Quick access to all the necessary information related to the nodes using the editing window: name, type (*Label* for symbolic state nodes and *Interval* for initially continuous variables), and probability distribution. Quick and concise description of probabilistic relations thanks to the Equation editor (discrete and continuous probability distributions, arithmetic and trigonometric functions, usual operators). Full Cut&Paste functionalities: network, node, table, equation, chart, report.

## Discover hidden knowledge in your data bases



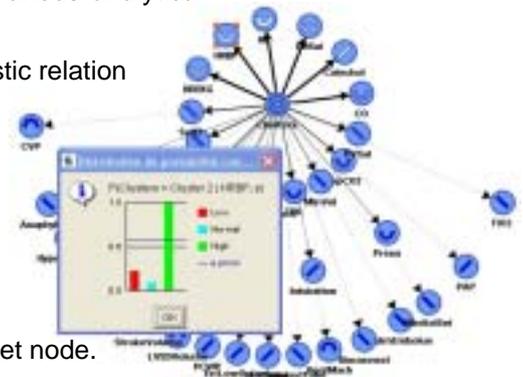
Use the import assistant to access the initial statistical information about your data, get rid of useless variables or values and discretize continuous variables. Select a learning method from among a large range of algorithms:

- Learning probabilities in order to refine your network from new cases;
- Unsupervised learning to discover the set of probabilistic relations (association discovery);
- Unsupervised learning to identify new concepts (Bayesian segmentation);
- Supervised learning entirely devoted to characterizing a target variable.

## Analyze your models quickly and efficiently

BayesiaLab makes it easy to understand your models thanks to its various analytical tools and its algorithms for automatically positioning nodes.

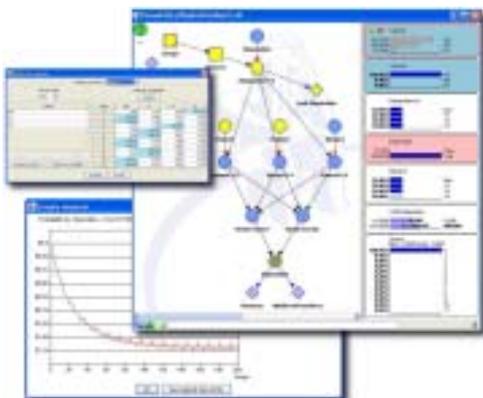
1. Arc analysis: thickness proportional to the strength of the probabilistic relation
2. Focused analysis: the lightness of the square inside the node is proportional to the amount of information it brings to the target
3. Analysis focused on a target value: a visualization of the force and type of influence that the variables have on the target value
4. Causal analysis by using essential graphs
5. Conflict analysis of the pieces of evidence entered into the net
6. Generation of complete HTML analysis reports focused on the target node.



## Exploit the power of Bayesian networks

Benefit from the power of Bayesian inference to simulate scenarios or to consider symptoms for diagnosing your system. Associate costs to acquiring values for the variables and BayesiaLab will dynamically generate adaptive questionnaires for you that identify the variables that are most likely to give the most information on the target variable for the least cost. Use your model to tag new cases described in a file. Associate qualities to states by using Utility nodes and exploit the reinforcement algorithms to discover the optimal action policies.

## Introduce a temporal dimension into your models



With its temporal arcs, BayesiaLab lets you integrate the notion of time in your networks and in doing so, you can dynamically model your systems. Follow the evolution, over time, of the probability distributions of your variables, step by step using the monitors in BayesiaLab. Simulate a specific time period by specifying the state of the variables being observed over time either graphically or in a file. Evaluate the consequences of your action policies (e.g. preventive maintenance policies or risk management policies) in terms of expected mean of gains/costs per time steps over a chosen period.