

BayesiaLab

A single tool for all your Decision Support and Data Mining Tasks

- Bayesian networks will allow you to model your expert knowledge relative to risk, fraud, customer s' behavior ...The graphical representation of Bayesian networks and the BayesiaLab's ease of use make it a invaluable **Brain Storming** and **communication** tool.
- You will be able to exploit all the power of unsupervised learning to extract from your data bases the **set of probabilistic relations that are really significant**. This kind of learning is a real **knowledge discovery** tool and is very helpful for the **understanding** of your problems.
- Supervised learning will allow you to **characterize your target variable**. This variable will represent, for example, the fraud, the propensity to buy a product, or the customer satisfaction. The evaluation of the automatically learnt Bayesian network on an independent test set (cases that have not been used for learning) will return you the model global precision, its confusion matrix (occurrences, reliability and precision) that will enable you to precisely know the prediction behavior of the network. You will also have **an interactive lift curve** that will help you finding the threshold representing the best economic compromise for your marketing actions.
- You will also be able to exploit the powerful Markov Blanket Learning algorithm for the **selection of the minimal subset of variables** that are really useful with respect to the target variable.
- **Clustering** of your data bases will enable you to discover **groups of homogeneous individuals** sharing the same characteristics. The HTML report that will give you the probabilistic profile of each identified cluster will help your experts to put a name to these clusters and to use them in your marketing campaigns.
- If Expert knowledge is available, BayesiaLab will rigorously merge it with your data bases.
- BayesiaLab will enable you **testing levers effects** (e.g. action for image improvement or for training) by manually adding nodes to your learnt networks. By associating cost nodes to these levers, you then will be able to **evaluate various action policies**.
- The BayesiaLab's **adaptive questionnaires** will return you the most relevant questions with respect to the information brought to the knowledge of your target variable and with respect to the cost associated to questions. A new set of ordered questions will be automatically returned after each answer.
- You will be able to use your Bayesian networks **off-line to automatically classify** new cases described in a data base. Two additional fields will be added to each case: the predicted value and its probability.

- By using the BayesiaLab's **analysis toolbox**, you will really be able to **understand** your data: analysis of the strength of the relations, analysis of the interaction between your target variable and the other variables, analysis of the relations linking all the variables with a specific value of the target variable, contradiction analysis to know if all the evidences support the same conclusion or if there are some contradicting evidences, causal analysis to transform the arcs that can be inverted without changing the probabilistic meaning of the network into edges.
- You will be able to “play” with your networks to easily test your hypothesis by carrying out **What-if scenarios**.
- Lastly, you will have access to a **rigorous imputation tool** that will use your Bayesian network jointly with all the available evidences to compute the probability distribution of your missing values, and then replace them accordingly.

Bayesia Market Simulator

The absolutely necessary tool for efficient market simulations

- First of all, you will use **BayesiaLab** to automatically learn a Bayesian network **modeling the choice** of the individuals with respect to their characteristics and those of the products.
- Then, based on a file containing individuals with their characteristics, a description of your market, you will use your Bayesian network to **efficiently and rigorously compute the expected market shares** corresponding to the products you want to launch on the market (scenario).
- You will be able to easily test all the scenarios you want on **market segments**, i.e. by selecting a subset of market characteristics.
- Bayesia Market Simulator will enable you saving in a file, for **each individual**, the **probabilities** associated to each product as well as the probability corresponding to the **reject** choice.
- You will also have the possibility to define **similarity rules** for your products. If a product belonging to a similar set of offers is rejected by an individual, the simulator will then consider that all the products belonging to that similar set will be rejected. In other words, the reject is due to the common characteristics of the offer.
- Lastly, text and HTML log files will allow you to keep useful traces of all your simulations.