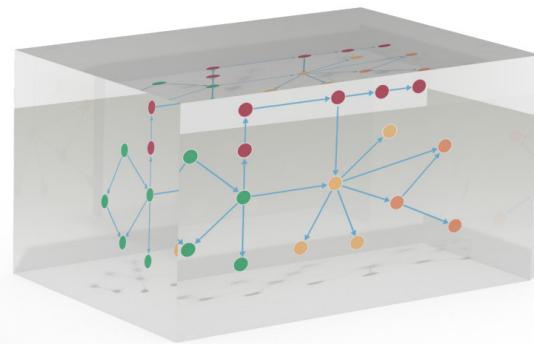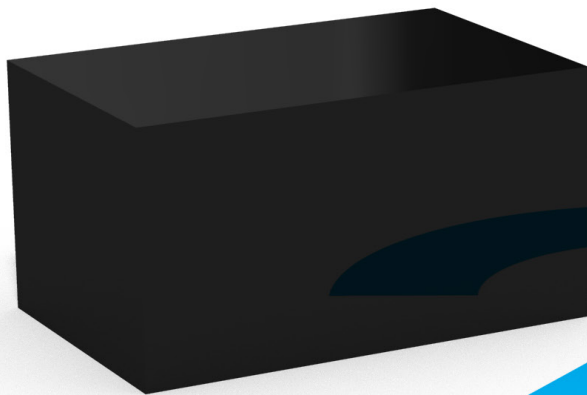# BAYESIALAB

Market research stands out as a quintessential use case for the BayesiaLab software platform. BayesiaLab is the only research tool that allows you to model markets, consumers, and products, in all their dimensions, in a single, universal and highly-transparent model.

BayesiaLab is built on the Bayesian network formalism, which is a type of mathematical model that can simultaneously represent a multitude of relationships between variables in a system. Unlike most statistical models, a Bayesian network is not a formula, nor does it contain any. Rather, it is a graph, which contains nodes, representing variables, and directed arcs linking the nodes, representing relationships between variables.

With BayesiaLab, you can generate a Bayesian network by encoding your own knowledge, i.e. by drawing nodes and arcs in BayesiaLab's graphical user interface. Alternatively, BayesiaLab can learn a network entirely on its own. Its learning algorithms can automatically recover the underlying structure from observed data, quite literally "connecting the dots."

BayesiaLab offers a wide range of analysis, visualization and simulation functions that permit you to study the high-dimensional interactions that can be captured in a Bayesian network model.

Nonstop from Data to Decisions

By modeling your market with BayesiaLab, you create a single line of thought from consumer data to decision recommendation. From the first step to the last, the modeling process leads directly to answering the question, "what is the optimal course of action under these conditions?" Given a Bayesian network model of your problem domain, you can derive policy recommendations immediately. Modeling and reasoning become an integral process, rather than being sequential steps.

This continuity also yields unprecedented analysis speed. BayesiaLab reduces the time lag between receiving data and delivering recommendations from months to days. As a result, you can report results to your clients in near real-time.

No Black Box

The inner workings of marketing models may seem mysterious to many decision makers. Black-box models typically require a giant leap of faith by anyone who was not immediately involved in their creation.

Not so in our workflow with Bayesian networks and BayesiaLab. Regardless of quantitative skill, any subject matter expert can scrutinize the inherently-transparent Bayesian network model by simply using common sense. For broad validation, all stakeholders can directly compare the network's structure with their own understanding of the problem domain. With such "structural buy-in," you can report conclusions with confidence.

Recent Customers & Clients

» Accenture	» Dassault Aviation	» GroupM	» Mead Johnson	» Orange	» Synovate
» Axciom	» Dell	» Hilton	» MAi	» P&G	» PennState
» AGC	» DGA	» Hyatt	» McGill University	» PSA Peugeot Citroën	» The Pert Group
» American Diabetic Association	» EADS	» Indian Institute of Management Bangalore	» Millward Brown	» Rainman Consulting	» The Martin Agency
» ArcelorMittal	» Électricité de France	» InterContinental Hotels Group	» Multimedia University	» Renault	» TNS
» Astellas Pharma	» ENI	» Ipsos	» Mu Sigma	» Rhodia	» Total
» BBDO	» U.S. EPA	» L'Oréal	» Nanyang Technological University	» RTI	» Turbomeca
» Booz Allen Hamilton	» Firmenich	» La Poste	» Nanyang Polytechnic	» Rutgers	» UCLA
» BP	» Fractal Analytics	» Lancaster University	» NASA	» Saint-Gobain	» Unilever
» Cap Gemini	» France Télécom	» Lieberman Research Worldwide	» National Analysts	» Samsung	» University of Maryland
» Cancer Care Ontario	» Geisinger Health System	» Lilly	» Nestlé	» Servier	» University of Toronto
» Cargill	» Georgetown University	» Lockheed Martin	» Neiman Marcus	» SingTel	» University of Virginia
» CDC	» George Washington University	» Louisiana State University	» Nielsen	» Smuckers	» U.S. Army
» CFI Group	» GfK		» Nissan	» Société Générale	» Vanderbilt University
» Crédit Agricole	» GlaxoSmithKline		» NTT	» Sony	» Veterans Administration
				» Starcom MediaVest	» Virginia Tech

Your Research Lab. BayesiaLab contains your entire research workflow, from data import to decision recommendation, in a single, graphical "lab" environment. The model of your domain is always front and center, allowing you to interactively explore your research topic.

Visualization. Even before its machine-learning algorithms come into play, you can leverage BayesiaLab's advanced visualization techniques, such as Distance Mapping. High-dimensional problems will visually "unfold" themselves in front of your eyes.

Analysis of Key Drivers. Using BayesiaLab's algorithms, you can identify key drivers among hundreds or even thousands of variables. Utilizing information-theoretic measures instead of covariance, BayesiaLab is not impeded by multicollinearity and complex interactions in high-dimensional datasets. This enables you, for instance, to quickly process large-scale satisfaction surveys and find out what really matters to customers.

Clustering & Segmentation. BayesiaLab allows you to perform Data Clustering and Variable Clustering, reliably and rapidly. With the help of numerous visual aids, you can classify your customers into relevant segments, even in high-dimensional datasets. Multiple Clustering combines both algorithms to induce latent factors from all your variables. This will help you uncover overarching themes in your data and reveal the "big picture" to your audience.

Probabilistic Structural Equation Models (PSEM). In the past, building Structural Equation Models consisted of countless iterations of specification followed by estimation, often requiring weeks or months of a statistician's time. With BayesiaLab, you can semi-automatically generate Probabilistic Structural Equation Models through machine learning. With significantly less time spent on modeling, you can fully focus on interpreting the dynamics of your domain.

Multi-Quadrant Analysis is a tool that allows you to rapidly generate models for subsets of the overall market. For example, you can first build a model of nationwide consumer behavior and then automatically regenerate this model for hundreds of metropolitan areas with the objective of performing regional optimization.

Missing Values Processing. Missing values are present in most market research data. However, most of the commonly-used methods for handling missing values have massive drawbacks. Statistically sound methods, on the other hand, require an exorbitant amount of additional modeling effort, which make them nearly intractable for conventional research projects.

With BayesiaLab, you can intuitively and seamlessly integrate missing values processing into your principal modeling task, so you will never again discard any observations due to missing values.

Causality, Attribution, and Synergies. Outside controlled experiments, attributing effects to causes is an enormously challenging task, although this difficulty is widely underestimated in practice. In fact, very few modeling techniques are capable of correctly estimating attribution, principally for lack of their ability to compute causal inference.

With BayesiaLab, you can compute (causal) Direct Effects on the basis of Likelihood Matching, a unique algorithm that automatically performs the equivalent of statistical matching. Thus, you can simulate decisions and estimate the consequences of actions not yet taken. Conversely, you can decompose historically observed effects and attribute them to their underlying drivers, both contemporaneously and across time. Using the same approach, BayesiaLab also allows you to formally compute the synergy effect between variables, which remains impossible to quantify in most other frameworks.

Optimization. On the basis of Direct Effects, you can use BayesiaLab to simulate any number of hypothetical scenarios, e.g. different levels of marketing spend across channels. Using a genetic algorithm, BayesiaLab will search systematically across the space of possibilities and return the scenarios that optimize the target variable. Additionally, you can provide costs, plus individual and global resource constraints. This allows you to find the optimum marketing mix for maximizing sales, or the ideal product configuration with regard to customer satisfaction.
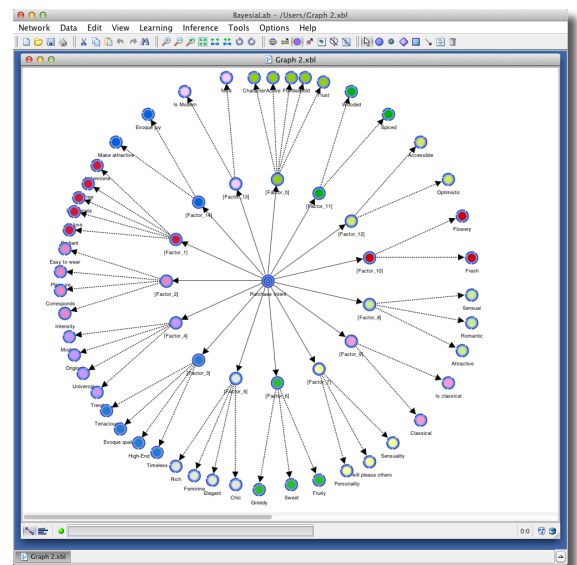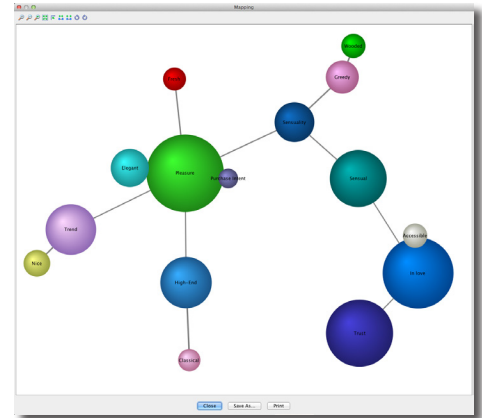
BAYESIALAB

(888) 386-8383

info@bayesia.us

For North America

Bayesia USA
312 Hamlet's End Way
Franklin, TN 37067
USA

+1 888-386-8383
www.bayesia.us

For Asia Pacific

Bayesia Singapore Pte. Ltd.
28 Maxwell Road
#03-05, Red Dot Traffic
Singapore 069120

+65 3158 2690
www.bayesia.sg

Headquarters

Bayesia S.A.S.
6, rue Léonard de Vinci - BP 119
53001 Laval Cedex
France

+33 (0)2 43 49 75 69
www.bayesia.com