

Health Informatics CoE Pilots Business effiScience HyperCube Platform

Over the past several months, the Health Informatics CoE has been working with Business effiScience to evaluate their HyperCube algorithm-based application. The company, based out of Paris, has developed a software suite that can take a clinical or scientific data set and non-statistically analyze the data for potential signals. In this context, a signal is similar to a rule or set of rules that can explain current data and predict future data.

The HyperCube algorithm that is utilized by the software originated in France 15 years ago. Tasked with the problem of explaining the root causes of nuclear dust treatment and the optimization of new generation casting technology, the Ecole Polytechnique labs (a military facility focused on mathematics) set out to develop a framework that could succeed where all classical modeling techniques had failed.

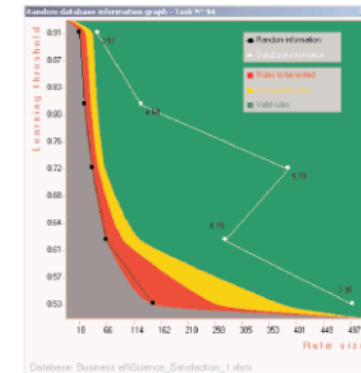
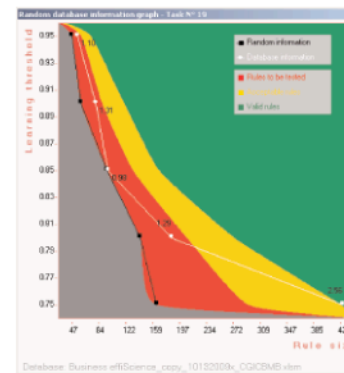
The software can exhaustively sample all possible risk or benefit configurations, including those featuring variables with an extremely low global influence, yet a strong local role (for instance, interaction of treatment and a particular predictor). It can simultaneously handle discrete and continuous variables and can identify and measure all of their combinations that can influence the issue analyzed.

The HyperCube application can process an essentially unlimited number of variables. It can potentially find each and every possible combination of variables that show a strong signal on the response.

In July 2009, the Health Informatics CoE began a pilot of this technology, working to learn the intricacies of the application and planning ways to test it with real data. Three main projects

have been tested with the application: data sets dealing with Dapoxetine, Carisbamate, and Paliperidone Palmitate.

In December 2009, the HyperCube pilot came to a close. However, discussions between the Health Informatics CoE and Business effiScience have paved the way for the application to become an on-demand service offering in 2010, in which application usage and support, along with analysis assistance, would be included with each project. Unlike the model used during the pilot, this new service approach will allow users to access the application remotely through a thin client on their local machine.



Before running the HyperCube algorithm, you can run the Signal Intensity Graph (SIG) to determine if any optimal configuration of learning threshold, granularity, and standard deviation exists. Good SIG graphs (on right) have green and yellow sections within the bounds of random information and database information.