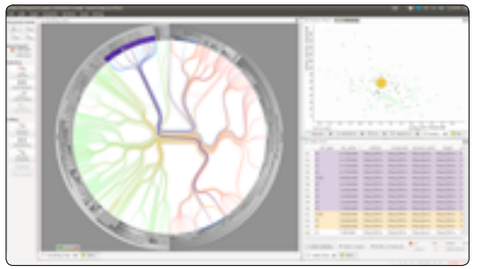
8. Finding new drugs by visualizing the effect of their ingredients



Finding new drugs to cure diseases is a hard task. This is because the chemicals in the drug interact in a very complex way with the cells and proteins in the human body. Visualizing this complex network of interactions is important to improve the development of new drugs.
Our demo shows how the interaction between the chemicals in a drug and the proteins in the body can be interactively explored in a rapid way. This rapid interaction makes it possible to get answers while you think, as opposed to waiting for answers, which breaks the train of thought.

ICT science question

How to effectively visualize large graphs? This is a hard problem. Graphs that contain more than a thousand nodes tend to become cluttered using most visualization algorithms.
The implementation we show in this demo accelerates the visualization by using a graphical processing unit (GPU). This makes it possible to interact with large graphs (in the order of magnitude of one million nodes).

Application

Our demo is an application of a well-known visual analytics tool (SynerScope) to the pharmaceutical data from the international Open PHACTS-project. Our visual tool combines a number of different visualization techniques to achieve highly scalable graph visualization while taking into account the interactions that help the user.
Natural competitors are visual analytics tool suites, like QlikView, Spotfire and Tableau, and open source tools like Gephi. However, they all miss scalable network visualization and rapid interaction response time.

Alternative Application

The SynerScope visual analytics tools have been used in forensics, fraud detection, anti money laundering, risk-based pricing of insurance products, insurance claims process optimization, and e-mail communication analysis.
Future high potential markets are: smart grid monitoring, logistics optimization, cybersecurity, telecommunication network monitoring, high-performance cluster maintenance, auditing of supply chains.

Nice to know

Usability studies have shown that SynerScope can be used effectively by high school students after a tutorial of only thirty minutes.

Quote

“SynerScope, this is an amazing story, they are solving very complex issues by looking at billions of transactions, […] They are saving the world of their share of the two hundred billion dollars that’s lost to fraud annually.” — Bill McDermott (CEO SAP)

Big data does not change the world, insight in big data changes the world. Large-scale visualization provides this insight.

Interactive exploration of network data reveals the hidden drivers behind trends. Knowing these drivers opens up new business opportunities.

Interactive visual analytics turns data analysis upside-down. We don’t just answer questions, we also question answers.

Explore your research data in completely new ways and discover patterns you didn’t know existed.

Willem Robert van Hage
willem.van.hage@synerscope.com
www.synerscope.com

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This research was supported by the Dutch national program COMMIT/