Navigating graphs of millions of nodes and relationships like a breeze with Linkurious

We introduce Linkurious[1], a new solution to store, search and visualize graphs of millions of nodes and relationships that can be handled by newcomers in ten minutes. We consider a property graph, in which properties are associated to nodes and relationships. For instance, gender and sex in a social network, bibliometric scores and classification in a citation network, etc. Real-world datasets contain millions of nodes and relationships, so the problem is to make sense and navigate easily in the visualizations. Here we consider the goal of finding information at the local level as fast as possible.

Following an idea of Perer and van Ham, in Linkurious the local view of the graph, displayed as a traditional node-link diagram, helps the user navigate smoothly from node to node, whatever the size of the graph. He enters the graph using a search engine that provides live auto-suggestions, then gets the result as a node from which he starts the exploration of the neighborhood by expanding its relationships. Expert users can ask fine questions using a query language (e.g. in a social network, "who among your co-authors in New York have also publish in mathematics for 3 years ?") and visualize the sub-graph result. He inspects node and relationship properties, and can modify, add or remove them to improve and fix data. He always stays focused on results by hiding unwanted nodes, highlighting what is important and filter out specific data at any time to quickly get the result he is looking for. Once done, he may export a picture of the result and share it.

Linkurious is made of two components : the frontend in HTML5 and Javascript, running in any modern web browser to provide the user interface, and the backend, server component connected to a graph database. The backend provides a fast search engine powered by ElasticSearch[2] and runs on any system able to support node.js, including Windows, Linux and Mac OS. It connects to a Neo4j graph database[3], which can handle dozen millions of nodes and relationships.

Linkurious continues the research efforts done with Stanford Mapping the Republic of Letters and DensityDesign in building Knot, a prototype to explore humanities data. It is currently distributed as a commercial application by Linkurious SAS and is already used by dozens of companies. We are looking for collaborations in knowledge mapping.
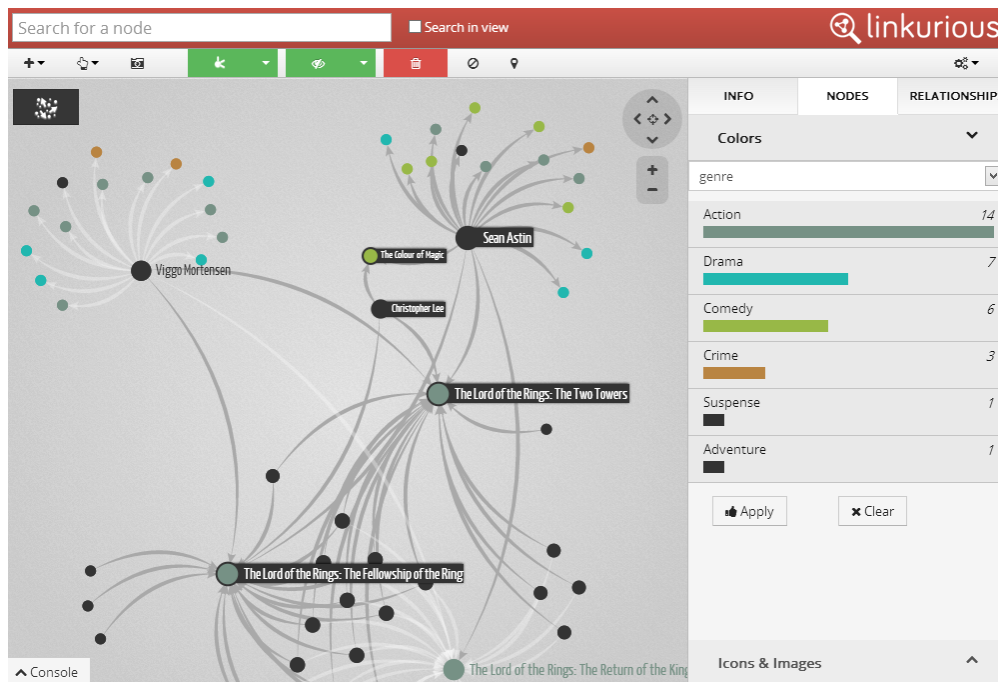

FIGURE 1 − Screenshot of Linkurious on a movie-actor database.

---

1. http://linkurio.us
2. http://elasticsearch.org
3. http://neo4j.org