

Visualization based on graph drawing allows the identification, the evaluation of passed and present structures between actors and concepts. It also allows the deduction of future ones. VisuGraph is developed in order to offer to users the visualization and the interactive classification of relational data. We propose to complete by animating the graph representation between various periods. The aim is to reveal the successive structures significant changes and determining actors and/or concepts.

Representation of evolutionary data

The relational data result from information treatments under Tetralogie platform. Data are represented in matrices forms by crossed entities over several temporal homogeneous segments (or time periods).

In a second step, these data are visualized by a graph representation, where the nodes represent entities and the arcs define the relations between them. It is possible to define a graph for each value of the temporal dimension.

Force-directed placement

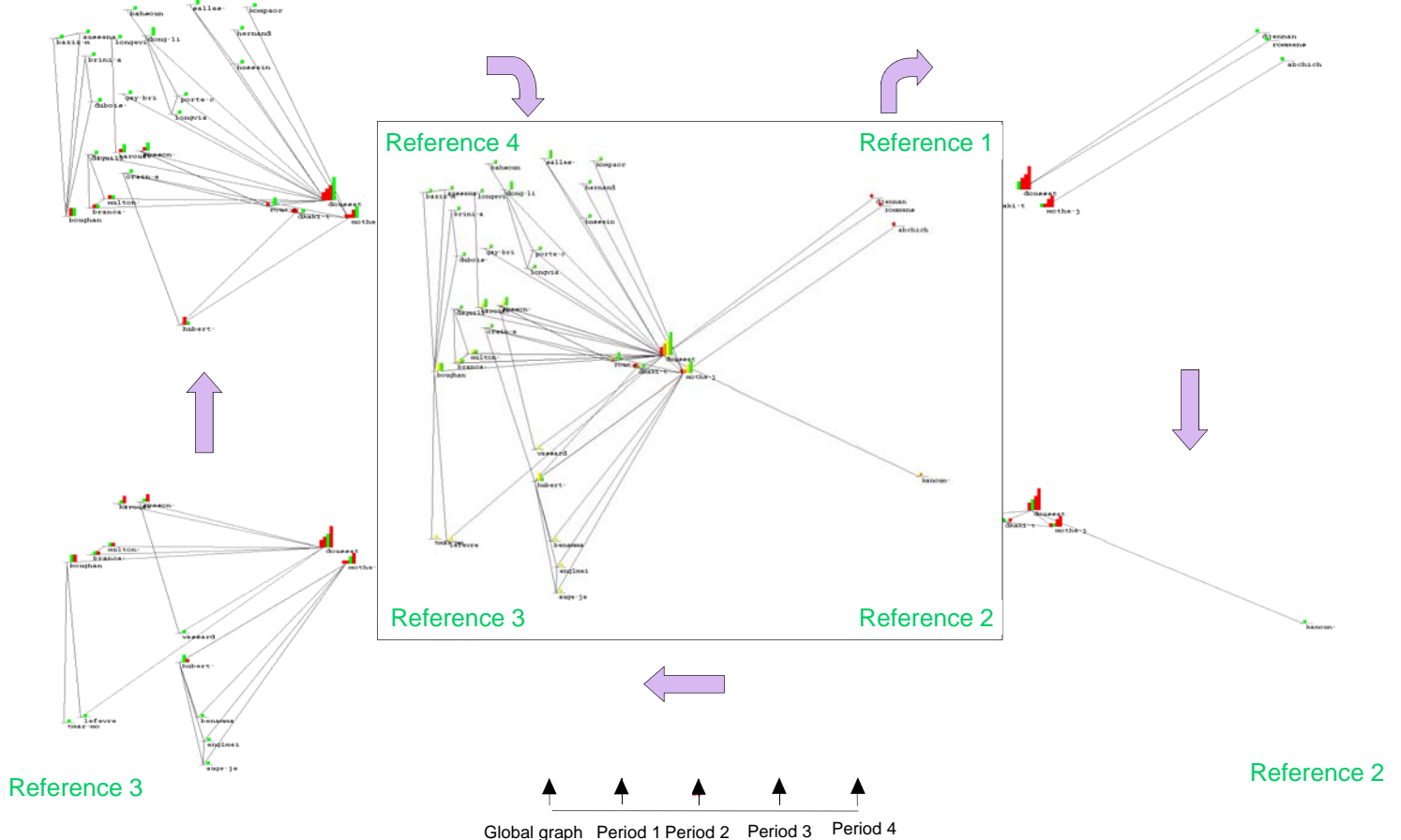
Force-directed placement functions follow generally accepted aesthetic criteria for graph rendering, including evenly distributed vertices, minimized edges crossings, and uniform edge lengths.

A graph is comparable with a spring model while taking as a starting point the physical laws of graph drawing. This system generates attractive and repulsive forces between the nodes that involve their displacement.

Graph animation

Reference 4

Reference 1



Invisible temporal references represent the various time periods. They are fixed in a chronological order and in an equidistant way on the circumference of the display window (like the hours on a clock).

Graph is influenced by the attribution of new bonds connecting each node to the temporal reference marks, which are related to the time period considered. It generates a displacement, locating each node next to the marks of the time periods that it belongs. After stabilization of the graph, each peripheral sector of the window corresponds to a typology of particular evolution. The graphs of various periods are represented successively, by simply hiding nodes and bonds not concerned by the selected period.

VisuGraph is an ergonomic and powerful tool for dynamic data analysis. It focus on various practical issues concerning detecting emerging trends and abrupt changes in transient research fronts. The encouraging results indicate that this is a promising research line with the potentially wide-ranging benefits to users from different disciplines.

Moreover, this morphing is conditioned by the user point of view. It can be directed towards the detection of strong signals (important or persistent) or weak signals (appearances, disappearances, reorganizations of actors which can be potentially interesting).