Multiple perspectives on bibliometric data: Combining different science mapping approaches using VOSviewer

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In the bibliometric and scientometric literature, many different approaches to mapping and visualizing science have been explored. For instance, maps can be created of documents, journals, authors, organizations, or terms. Given the choice of a particular unit of analysis, the relatedness of objects can be determined based on citations (i.e., direct citations, co-citations, or bibliographic coupling), co-occurrences (in the case of words or terms), or co-authorships (in the case of authors or organizations).

In the newest version of our VOSviewer software for creating and visualizing science maps (released in May 2012 on www.vosviewer.com), we offer extensive support for directly creating maps based on output files from the Web of Science (WoS) database. In the past, this functionality was not available and users of VOSviewer had to find their own solution for converting WoS output files into a VOSviewer readable format. The new WoS support offered by VOSviewer is perfectly suitable for combining and comparing different science mapping approaches. With just a few mouse clicks, it is possible to move from a document map based on bibliographic coupling to, say, an author co-citation map or a term co-occurrence map.

We will present an application of the new VOSviewer functionality to a bibliometric data set on the topic of visualization and text and data mining. We will show how multiple perspectives on the scientific literature can be obtained by combining different types of maps. We will also discuss the strengths and limitations of different mapping approaches.
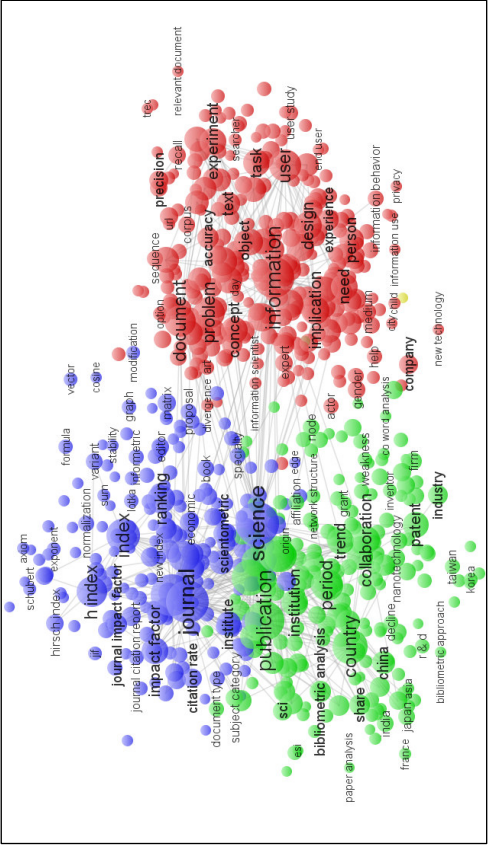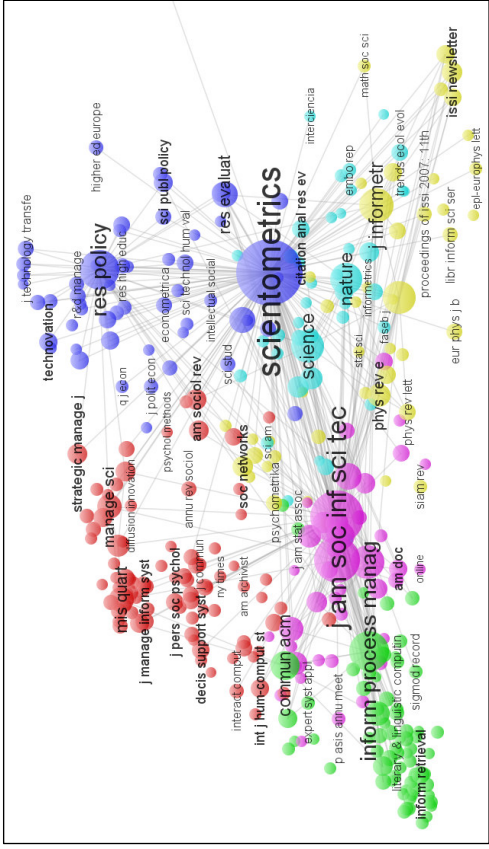
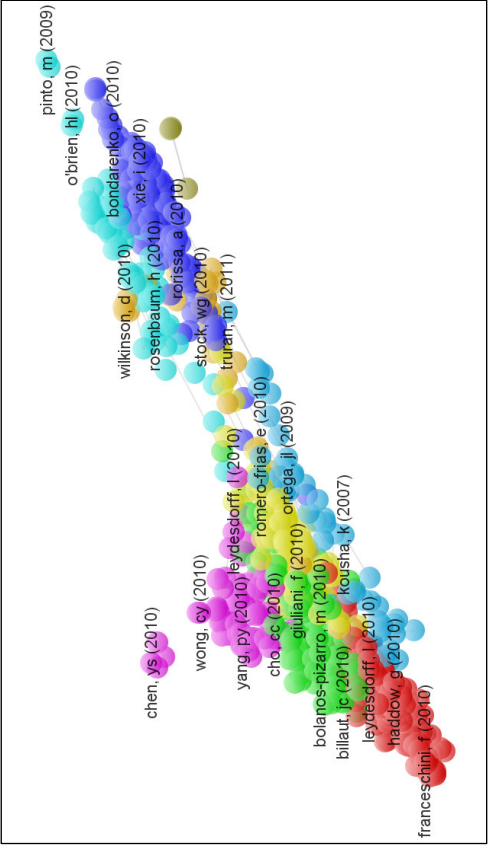Figure 1: Term co-occurrence map

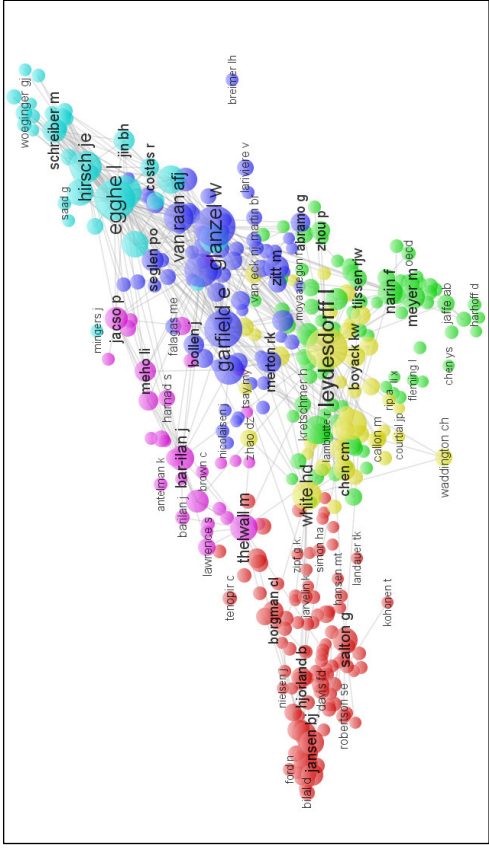Figure 2: Document map based on bibliographic coupling

Figure 3: Journal co-citation map

Figure 4: Author co-citation map