

MDS-based Visual Survey of Biological Data Visualization Techniques

Andreas Kerren*

Kostiantyn Kucher

Yuan-Fang Li

Falk Schreiber

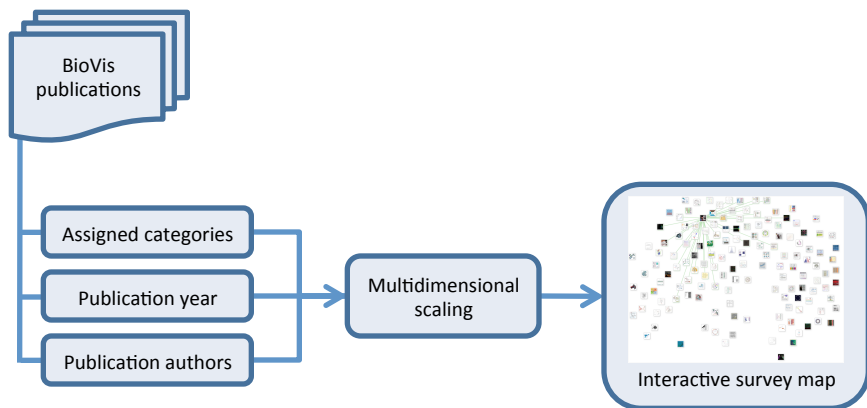
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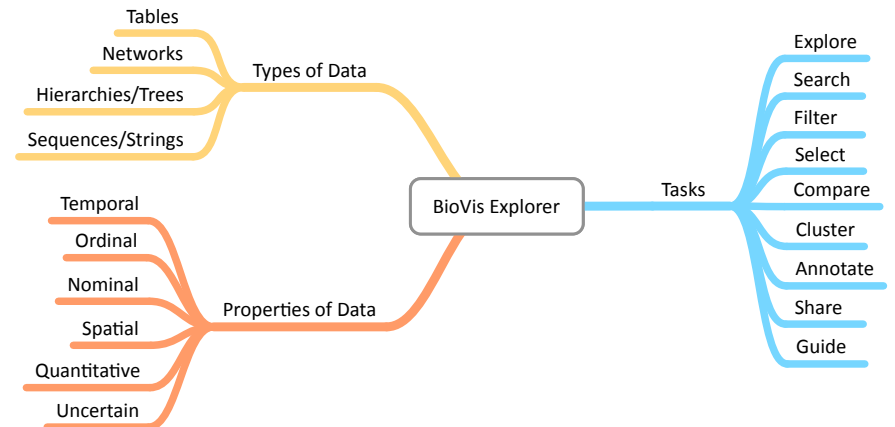
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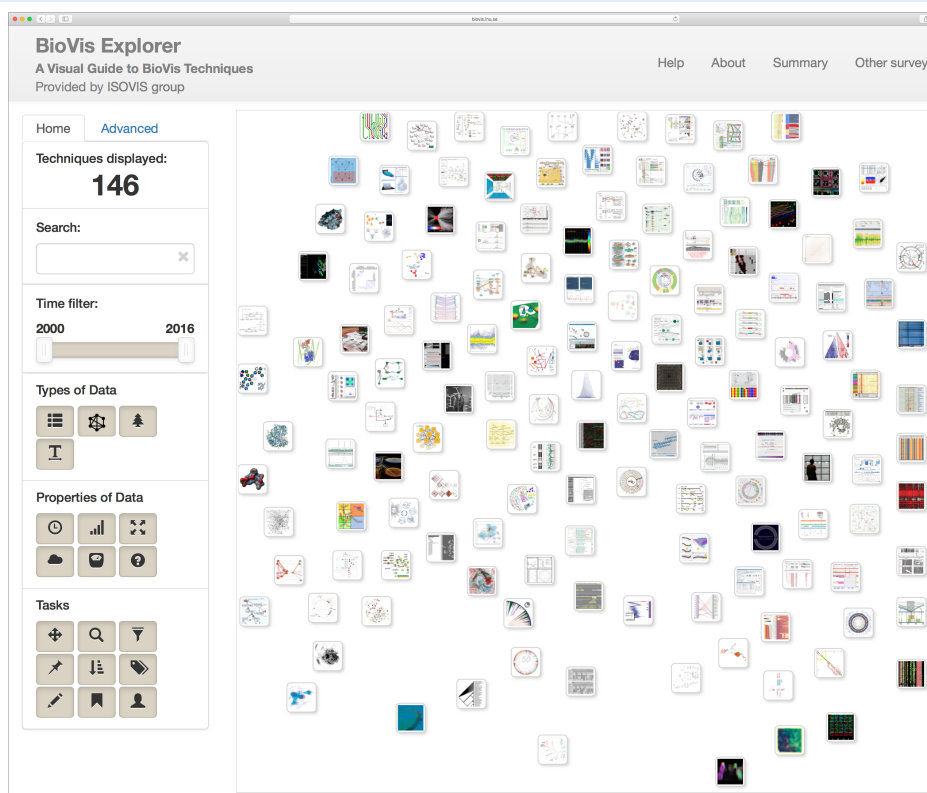
Data visualization is of increasing importance in the Biosciences. During the past 15 years, a great number of novel methods and tools for biological data visualization have been developed and published in various journals and conference proceedings. As a consequence, keeping an overview of state-of-the-art visualization research has become increasingly challenging for both biology researchers as well as visualization researchers. To address this challenge, we have reviewed visualization research for the Biosciences and created an interactive web-based visualization tool, the BioVis Explorer. BioVis Explorer allows the exploration of published visualization methods in interactive and intuitive ways, including faceted browsing and associations with related methods. It is available at <http://biovis.lnu.se>



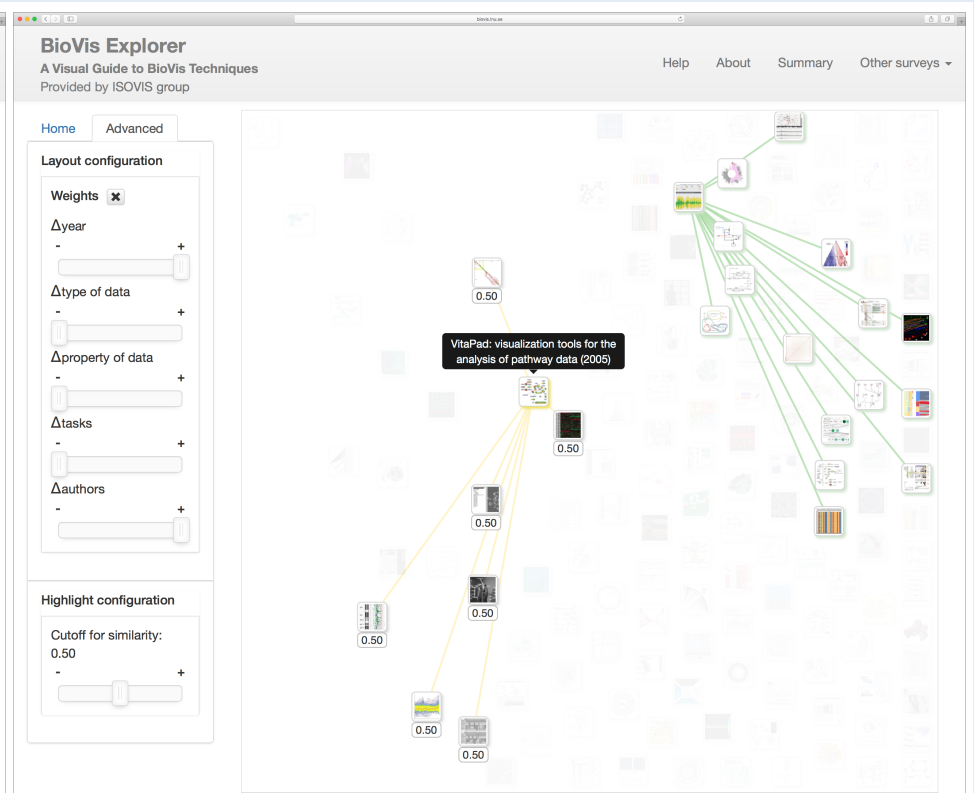
The overview of the approach used in our interactive visual guide to BioVis techniques, called BioVis Explorer



The taxonomy used by BioVis Explorer



(a)



(b)

(a) The web-based user interface of BioVis Explorer. Each publication that presents a new BioVis technique is represented by a small rectangular thumbnail. The thumbnails are arranged in the 2D plane by using multidimensional scaling, i.e., similar techniques are close to each other (similarity is based on a number of factors such as publication year, publication authors, and categories assigned according to our taxonomy). By using the interaction panel on the left hand side, researchers can look for specific BioVis techniques and filter out entries with respect to a set of categories. The survey currently contains 146 categorized BioVis techniques published between 2000 and 2016.

(b) Demonstration of interactions such as highlighting and selection pinning for a layout affected by modified distance weight factors (see the panel on the left hand side). The links to similar techniques are displayed for the currently highlighted and pinned techniques in yellow and green, respectively. The user can also adjust the value for the similarity cutoff/threshold to control which techniques will be considered similar or dissimilar. The actual similarity values for related techniques are displayed below the respective thumbnails when highlighting a technique.

*Contact: andreas.kerren@lnu.se

