

THE ISMIR PAPER EXPLORER: A MAP-BASED INTERFACE FOR MIR LITERATURE RESEARCH

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ABSTRACT

The ISMIR Paper Explorer allows to browse all papers published at ISMIR using a map-based interface where similar papers are close together. The web-based user interface creates the impression of panning a large (global) map by aligning inexpensive small maps showing local neighborhoods. By directed hopping from one neighborhood to the next, the user is able to explore the whole ISMIR paper collection.

1. INTRODUCTION

Ever since the ISMIR conference has come to live, all related publication have been publicly accessible. Over the years, the cumulative proceedings available at <http://www.ismir.net/proceedings> have grown to exceed a thousand papers and now provide a great source for researchers who would like to familiarize themselves with the field of music information retrieval (MIR). The classical search interface based on keyword search and result lists is well suited for users who know what they are looking for. However, in other scenarios, this might not be the ideal search approach and the amount of papers and topics can be overwhelming. Exploratory information retrieval systems support users with vague or evolving information needs by providing special user interfaces and interaction models. The ISMIR Cloud Browser [2] available at <http://dc.ofai.at/browser> allows browsing through links of related terms. Our new web-based search interface, the ISMIR Paper Explorer, takes a different – more visual – approach to exploration using similarity-based two-dimensional maps. It can be accessed at <http://demos.dke-research.de/nemp-ismir/>.

2. VISUAL BERRY-PICKING

Exploring document collections using similarity-based two-dimensional maps is an ongoing research area that faces two main challenges: with increasing size of the collection and

complexity of the similarity metric, projection accuracy rapidly degrades and computational costs prevent online map generation. The visual berry-picking technique introduced in [4] addresses these issues. The idea is to visualize only the set of k-nearest neighbors for a given seed document in a small map. By choosing another document as a seed, the user is able to hop from one neighborhood map to another. Consecutive maps are aligned to create a consistent transition that is, ideally, perceived as panning a large (global) map. Users are able to transfer knowledge about the content and the relevance of documents accumulated during the exploration process from one visualization to the next. This allows the user to navigate step-by-step through the whole collection.

We apply Multi-dimensional Scaling (MDS) [3] for dimensionality reduction. By limiting the number of documents used to compute the projection, we reduce the impact of projection errors and thus visualizations become more reasonable. Transitions between consecutive maps are animated. In order to make these transitions as consistent as possible, we align consecutive maps on their common neighbors. We use Procrustes analysis [1] to reduce the sum of the squared differences between the two sets of images that remain visible during the transition.

3. USER INTERFACE

The user interface as shown in [Figure 1](#) consists of three major components: a search bar on top that provides a keyword search interface and access to the settings for the visualization, the map visualization on the left and a detail pane that displays the meta-data and the abstract or a preview image for the paper that is currently in focus. A search can be started by clicking on one of the initially displayed papers or by typing query terms into the search bar. This will generate a map of the 30 most relevant ISMIR papers for the query. By clicking on any paper, it will gain focus (indicated by a blue border) and the map will change to display the 30 most similar ISMIR papers using this paper as new query. A paper can also gain temporary focus (without map update) by hovering the mouse pointer over it. The number of displayed papers can also be changed in the settings. As alternative to the default map visualization, the papers can be arranged in a grid layout that preserves similarities and, in addition, avoids overlaps, see [Figure 2](#) (right). Papers can be bookmarked using the bookmarking function built into the web browser. Furthermore, the browser's back and forward buttons allow to step through the search history. Further func-



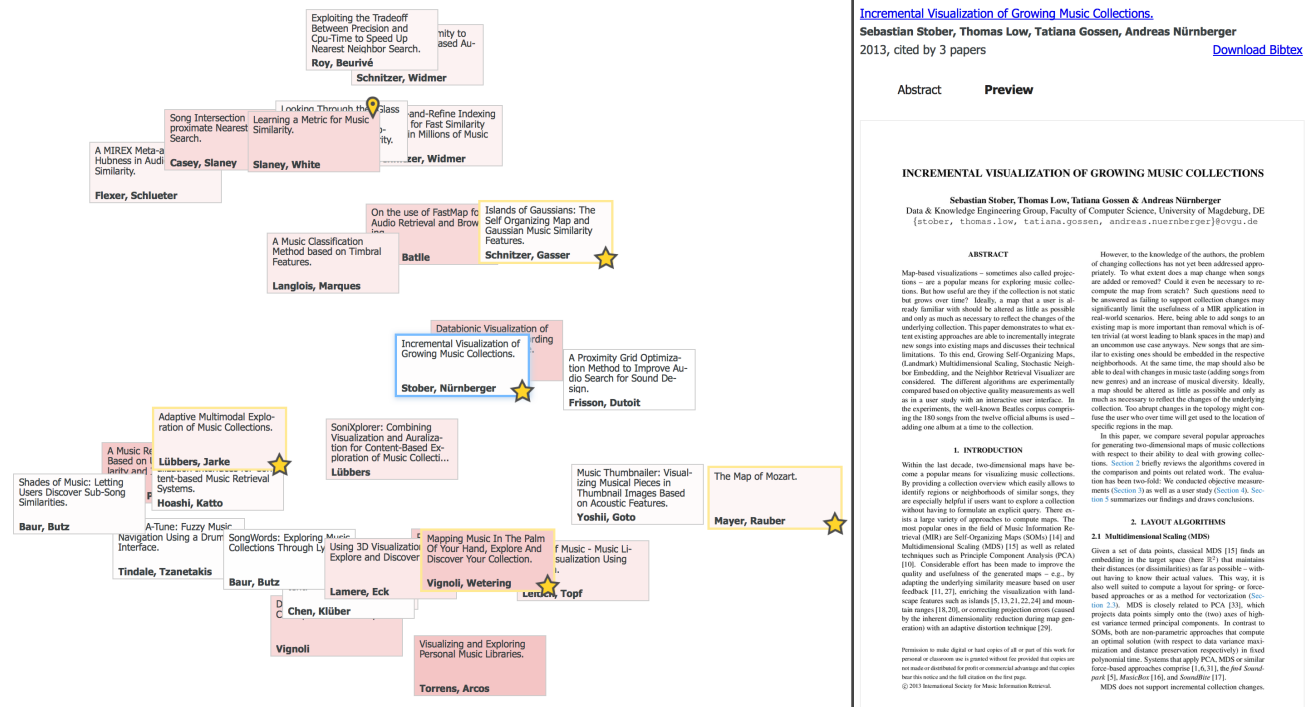


Figure 1. Screenshot of the ISMIR Paper Explorer showing the search bar (top), the map (left) and the details pane in preview mode (right). Clicking the button in the top right corner leads to a short usability survey.

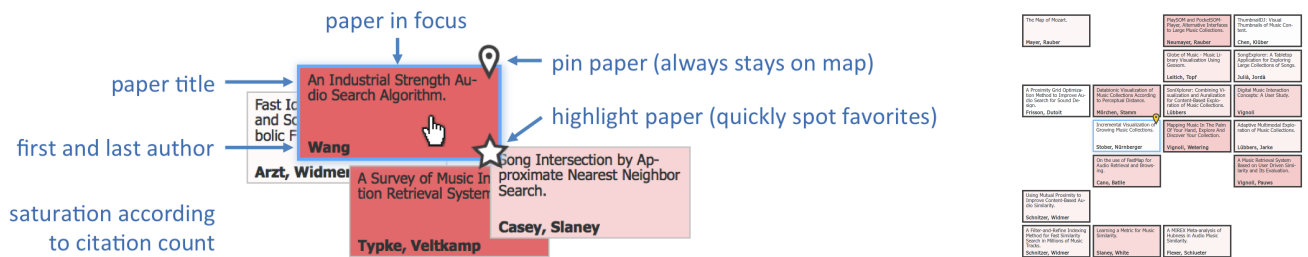


Figure 2. Left: Explanation of the visual elements used in the map. Right: Documents arranged without overlap in grid mode.

tion comprise pinning and highlighting of individual papers as explained in Figure 2 (left).

4. CONCLUSIONS & OUTLOOK

We have presented an exploratory search interface that allows to browse the cumulative ISMIR proceedings using a map-based technique called visual berrypicking. We hope that the ISMIR Paper Explorer proves to be a useful tool for the MIR community and beyond – helping researchers to familiarize themselves with the field of MIR and gather information about the state of the art in a specific topic. To further improve the interface, we would be happy about feedback and opinions. To this end, users can participate in a short survey by clicking on the button at the top right of the interface.

5. REFERENCES

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