Interactive Demo: Stay in Touch with InfoVis – Visualizing Document Collections with Document Cards

Hendrik Strobelt∗
University of Konstanz (CG Lab)

Mathias Heilig†
University of Konstanz (HCI Lab)

Oliver Deussen‡
University of Konstanz (CG Lab)

ABSTRACT

Large document collections are essential resources for a wide variety of professionals, like scientists, lawyers, analysts, etc. An electronic document management system can assist them in solving the tedious tasks of curating, browsing, searching, and recognizing documents in these collections.

As an initial step in creating such a system, we invented the Document Cards [3] as a mixed image-text document representation. The demo system utilizes these single document representation and extends the approach to allow interactive investigation of multiple corpora for multiple users. We will present InfoVis conference papers from recent years. Displayed on a touch screen, the system provides sufficient interaction with an immersive access to the documents.

1 INTRODUCTION AND MOTIVATION

A document management system is beneficial for a single user. It should allow browsing and investigation of a document collection or even multiple corpora. For intensive analytical tasks on documents, visual analytics systems are a good choice [2]. In the setting of a conference, a document management system becomes a collaborative, multi-user system. The paradigms for representation and interaction change from being user customized to being general and supportive for collaboration. We intend that the interaction with our demo system will motivate participants to browse through documents, rate the interesting ones, and discuss them with colleagues. The interactions are kept intentionally simple to ensure and remain general understanding.

2 APPLICATION AND INTERACTION

The documents will be represented on an information landscape, which can be explored using a zooming and panning navigation [1]. The multitouch capabilities of the screen are used to allow pinching gestures to enlarge card and group items. Additionally, we decided to use a multitouch screen to allow a democratized interaction between multiple users. Single touch gestures allow interaction in the manner of a point-and-click device. Active regions can be “clicked” to trigger an action. The items can be moved by intuitive dragging.

The following parts of this section describe interaction ideas realized in the demo system.

2.1 Interacting with a single Document Card

Each Document Card allows interaction to explore the content of the represented paper. Figure 1 shows the active regions of a card. Clicking (touching) the title section brings up a tooltip showing the abstract text of a document. Especially in small scales this method remains readability for the abstract text. Each term can be selected and highlights the images, which contain the term in their textual descriptions (caption, full text references). Additionally the densities of term occurrences for each page are shown as highlights of different intensities of red in the page list. The page list section allows switching the representation from overview (asterisk) to page view for every page of the document (numbers). When selecting an image, it translates to its original position in the document to allow further investigation in the context of the image.

2.2 Semantic Zooming

To avoid information overload semantic zooming allows items to be enriched with more semantic detail when zoomed in and to remove semantic detail when zoomed out [1]. The semantic zooming in the demo system is realized by blending between discrete static layouts appropriate for different zoom level. Figure 3 shows an example of a card canvas at two different level of detail. When zooming out, the least important elements are removed from the layout to ensure more space for the remaining elements. To ensure legibility for text elements, their relative size in the canvas has to increase. As seen in the figure, the terms voronoi tesselation and voronoi region have approximately the same absolute size for canvases of different sizes.

The interaction capabilities of items are adapted to different zoom level. Detailed card interactions described in the former section are disabled in small scales to avoid confusion.

2.3 Grouping

To remain overview, documents can be grouped according to a specific intrinsic feature. Such intrinsic features are e.g. the collection to which a document belongs to or the first letter of the publication title. Each group forms a group card showing the Document Cards of its members. The view on each group can be switched between a
Figure 2: Two group cards representing the InfoVis 2008 and InfoVis 2009 corpora as groups of Document Card canvases.

Figure 3: A card canvas at two levels of detail.

2.4 Collaborative/Community Interaction

To allow collaborative interactions or interactions within a community, we offer three strategies in our system. First, the users can compare different papers directly against each other. Second, the users are able to give a rating score, to express their favor for a specific scientific publication and therefore motivate other users to have a closer look. Third, when users accidentally explore a new, relevant paper for their work, they can directly send an email citing the newly discovered paper to themselves or a colleague.

3 Research Questions and Conclusion

With this demo system we want to investigate, how conference attendees use the intuitive interaction metaphors on a public document management system. We want to evaluate feedback on the questions: Is this system good enough to induce scientific discussion in the community? What are possible extensions? Does this system support serendipity? Is the approach of Document Card sufficient to the users (and to the authors)? Finally, there is scope for including papers and other scientific documents from a wider range of meetings and conferences and we hope to explore these possibilities in the future in light of our experiences at VisWeek.

Acknowledgements

Many thanks go to Enrico Bertini and the Schloss Dagstuhl seminar attendees. This work has partly been funded by the German Research Society (DFG) under the grant GK-1042, Explorative Analysis and Visualization of Large Information Spaces, Konstanz.

References

