

Multilevel Displays and Document Blueprints: Dynamic Browsing Using XML Structures and Text Features

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Abstract

In this paper, we discuss how researchers can benefit from tools that allow them to work with visualizations that rely on XML data at different levels of granularity. For these visualizations, we propose using a single interface that draws on the underlying structural information at both the collection level and the level of the contents of the individual documents. We compare two models of this kind of interactivity that are the subjects of our current interface design and prototyping activities. One of these systems is predicated on displays relying on sequence, and the other on visualizing the structure of items and facilitating their traversal.

Discussion

The common goal of these interface systems is to provide researchers with experimental means of combining overviews of a document with tools for manipulating the display. First is our multilevel document visualization system (Ruecker et al. 2005) that combines three or more simultaneous displays, including a microtext column showing collection items, a separate microtext column showing the contents of a particular document, and a reading view of the document. These different levels of display are combined with tools for selecting and manipulating a portion of the text in a subsequent display.

The purpose of the multilevel system is to allow the user to work with a digital document within the visual context of related material. We have currently installed it as a feature in the prototype for watching digital scripts, where the standard reading view is supplemented with a digital stage that allows the reader to see both the dynamic text playback and the blocking of the characters as they move around the stage. We are currently

carrying out a user study of actors using the system to learn their lines.

In addition to the dynamic text, we have recently begun to consider the possibilities of using the microtext columns as opportunities for providing overviews that can provide further data. For example, they might be colour-coded and re-organized according to some useful principle. In the Watching the Script demo, one form of colour-coding currently available – for plays that have been encoded in XML that marks the character names – is to help the reader differentiate between characters.

For purposes of a director planning the play, this overview allows exploration of the various relationships of the characters on the stage. It can be used to address questions such as who is on stage when, and with who, and how many lines does each actor have? By selectively applying colour only to the character or characters of interest, and having the remainder display in regular black text, the director has a tool for studying the entire play from the perspective of the staging.

Another overview panel in the prototype provides a list of the characters. As a simple display it does not provide many affordances, but with the addition of some further information and the ability to sort, this list also has potential benefits. For example, if we give the user the opportunity of adding next to each character the number of lines that character speaks, or a total of time spent on stage, or both, and then rearranging the characters according to those numbers, we have another tool for use in understanding the play at an overview level, and for planning production. Combined with the blocking tool, these overviews and their related tools begin to create a tool suite that we hope will prove useful to actors, directors, and students of theatre.

The second prototype produces what we are calling a Document Blueprint: a compact visual representation of the markup in a document. This blueprint can be used to suggest encoding particularities of a document by colour-coding tags and attributes in flexible ways. The identity – and therefore colour-coding – of sections can be defined in ways that ignore certain nodes in an XML tree, including elements, attributes, and text.

Our first application of this system is to generate a document view where the table of contents is initially displayed in a legible font size and the markup of sections are displayed in small, blueprint mode (where visual cues from the text emerge but the text itself is too small to be legible). The Document Blueprint system allows the user to define which elements to toggle between legible and blueprinting modes. Depending on which elements the user chooses, the system provides a variety of overviews that can help both in understanding and navigating the document, much as the conventional table of contents has always done, but with the important differences of dynamic display and interactivity (Ruecker 2005).

Future Directions

For the multilevel display, we are currently working to extend the affordances of the various overview items. It may be useful, for instance, to allow the entire surface to be temporarily subsumed by the overview that currently only occupies one column. The more complex display would show the data, still not at a reading view, but at a smaller level of granularity. Colour-coding and reorganizing this form of display could prove both interesting and useful.

The document blueprinting project is the youngest of our prototype projects and will likely evolve the most in the coming year. We are developing this system in collaboration with the Orlando Project, which in its next phase will be producing literary critical material in volume form. The dynamic table of contents in this case will be used as a navigation aide for readers interested in browsing through the extended prose of the three volumes. As has been the case with each of the prototypes, we will pursue an iterative cycle of design, prototyping, and development, with user study and experiment at each stage of the cycle.

Bibliography

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