

Towards Rich Information Landscapes for Visualising Structured Web Spaces

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Abstract

The Harmony browser for the Hyper-G Web server utilises Hyper-G's rich data model to provide a number of tightly-coupled, two- and three-dimensional visualisation and navigational facilities. In particular, the Harmony Information Landscape visualises the hierarchical structure of Hyper-G spaces upon a plane in three-dimensional space.

The Harmony Information Landscape has now been extended to display a combined structure and link map by selectively superimposing hyperlink relationships in the vertical dimension above and below the hierarchy map. In addition, documents returned by search queries may be selectively "plotted" in the landscape, indicating their whereabouts in a broader context, and several sets of 3d icons are available for representing the various document types.

Introduction

Tools such as the File System Navigator [1] and GopherVR [2] use landscape metaphors to visualise hierarchically structured information. The former visualises (part of) a Unix file system, whereas the latter visualises a level at a time of a Gopher server's menu hierarchy. Both use available metadata such as file size and type to encode visual attributes of the visualisation, but neither support any concept of hyperlinks in addition to hierarchical structure.

The Hyper-G Web server (and its commercial version, HyperWave) [3, 4], on the other hand, as well as supporting a-priori organisation of information into hierarchies and providing a rich set of standardised metadata, provides typed, bidirectional hyperlinks and fully integrated search and indexing facilities. With such lavish supporting infrastructure, it is possible to generate tightly-coupled, multi-faceted visualisations of the information space.

Extending the Harmony Information Landscape

The Harmony client and authoring tool for Hyper-G provides numerous information management and visualisation tools [5]. In particular, the Harmony Information Landscape visualises the hierarchical structure of Hyper-G (and Gopher) spaces upon a plane in three-dimensional space. Underlying metadata is used to encode visual attributes of various elements in the landscape display. This tool has now been extended to selectively superimpose hyperlink relationships in the vertical dimension orthogonal to (above and below) the plane of the hierarchy map. Utilising the third dimension in this way allows a combination of both hierarchical and hyperlink structure to be viewed together in one visualisation.

Figure 1 illustrates the combined display of hierarchical structuring and hyperlink relationships for the image document entitled "Map of Graz". This image document is a street plan of the city of Graz and has numerous incoming and outgoing links. Documents having links to this image are displayed on the lower plane, documents or collections reachable from the image are displayed in the upper plane.

To help prevent clutter, the relationships shown can be restricted by link type. In the "Map of Graz" example, standard referential hyperlinks are shown. Other link types include inline images, model textures, annotations, etc. A further control shows where the linked documents are located in the collection structure, by opening up paths to their position in the main plane and making arcs to them. Clicking such an arc flies the user gently down the path to the appropriate location.

Other recent refinements include location feedback for search results. Documents returned by search queries may be selectively "plotted" in the landscape, indicating their whereabouts in a broader context. In addition, several sets of 3d icons, from simple blocks through abstract polyhedra

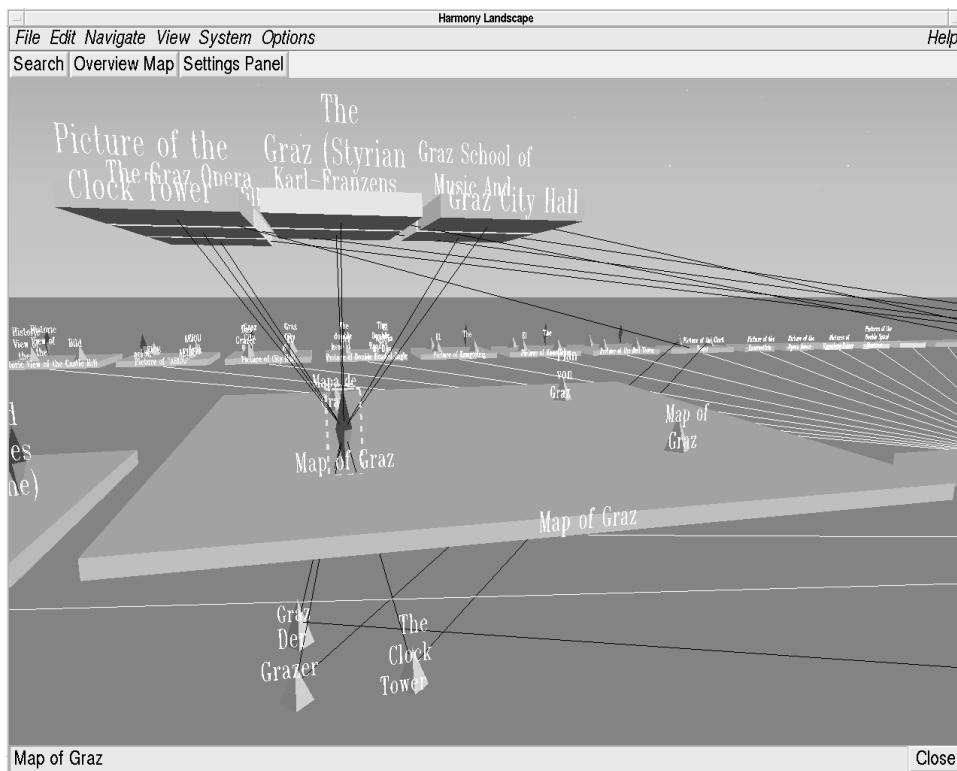


Figure 1. Superimposing hyperlink relationships upon the structure map.

to realistic and textured shapes, are available for representing various document types. By default, abstract polyhedra are used but other can be styles chosen and individual icons can be configured using the icon chooser shown in Figure 2 below.

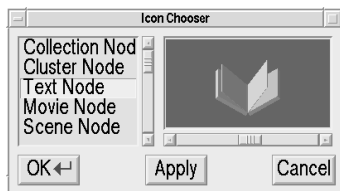


Figure 2. Landscape icon chooser.

Concluding remarks

The Harmony Information Landscape provides a rich information landscape, which builds on the lavish underlying infrastructure provided by a Hyper-G server. It now has facilities for presenting combined structure and link maps, for displaying the whereabouts of documents matching a query, and for choosing iconic representations for document types.

Further information about Hyper-G and Harmony is available at <http://hyperg.iicm.edu/hyperg>.

The software and associated documentation is available at <ftp://ftp.iicm.edu/pub/Hyper-G/>. This work has been partly financed by the Anniversary Fund of the Austrian National Bank, under project number 5334.

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