Chapter II

Presenting Large and Complex Information Sets on Mobile Handhelds

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Abstract

The opportunity to access information at any time and any place caused a boom in the development of small mobile devices in recent years. Due to their application, these handhelds become smaller and handier, which leads to new challenges in human-computer interaction. Due to limited resources of these devices new paradigms for information presentation and interaction facilities are needed. We take this into account by applying concepts for interaction and display of information from the field of information visualization to mobile pocket-sized devices. We focus...
on concrete problems caused by presenting huge images and large hierarchies in such environments. Moreover, we introduce an effective technique for browsing the World Wide Web via mobile handhelds. The presented techniques offer an improved support in navigation, orientation and interaction that enables the user to browse, interpret and handle presented information much more easily.

**Introduction**

Small mobile devices have become more powerful and popular in recent years, and are used in different application areas. Typical examples are personal mobile navigation systems. However, in the future, the wireless and mobile access of data and information via little handhelds will become as popular as browsing the World Wide Web. Since mobile handhelds suffer from limited resources, like screen space, interaction facilities and computational power, new paradigms for presenting and exploring complex information on such devices are needed.

On the other hand, in recent years the visualization of complex information spaces has evolved to an important and innovative area in computer graphics. A variety of novel visualization approaches and frameworks have been developed and proposed. Nevertheless, these approaches were designed for stationary devices, and using them for mobile handhelds leads to unsolved problems.

This chapter focuses on the presentation of complex information on pocket-sized devices. Information can be represented graphically or by abstract data sets. Due to the reason that both types require different treatment for presentation purposes, we want to discuss them separately.

Graphical information can be described in many ways, for example by text, images, video, or combinations of them. To discuss typical problems, we limit our considerations to one main and frequently used class: still images. Here, we focus on raster graphics and show how special presentation techniques can be used to solve the problem of exploring large images on small displays (third section).

Non-graphical, for example, abstract information, can also be described by a wide range of representations. However, the main challenge for representation is to support the navigation and orientation in often complex information
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