Improved Scroll Bars

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ABSTRACT

In general, scroll bar designs are weak and do not offer adequate cognitive aids to help the user trying to form a mental model of the material. Several suggestions of better designs have been presented, and we have developed some of them further. In this paper, we present two components, an improved scroll bar with bookmarks and a calendar scroll bar, which we have implemented as reusable Java Beans.

Keywords

Scroll bars, components, Java Beans.

INTRODUCTION

The commonly used widget sets offer inadequate scroll bar components which contain only few or no cognitive aids for the user who tries to create a mental model of the contents of the scroll area, i.e. of a web page or a Word document, for example. In 1992, Shneiderman has suggested several improvements, including the possibility to mark a particular position and see a small triangle on the scroll bar [4, p. 345]. When the user clicks on the triangle, the scroll bar jumps to that location. We have developed this idea further and given the user the possibility to add bookmark labels next to the scroll bar. The goal is to transfer the knowledge in the user's memory to the knowledge in the world [2] as effectively as possible.

Another goal of the bookmark scroll bar was to offer the user an overview plus detail of the displayed document [1, 3] and to present the overview on the scroll bar [4]. The scroll track may show section boundaries of the document, or highlight all the code examples of a programmer's manual, or show all the images of the document, for example. Our calendar scroll bar takes this idea of showing interesting attributes even further. The scroll area shows a calendar strip including visual cues of interesting days.

The components have been implemented as reusable Java Beans. The Java Bean component model makes it possible to use the components in user interface management systems (UIMSs) or other builder tools for Java.

BOOKMARK SCROLL BAR

The bookmark scroll bar has a bookmark area next to the scroll bar (Fig. 1). When the user drags the thumb into the bookmark area, the drag snaps to the nearest bookmark. Alternatively, the user can move to the bookmark by simply clicking it with the mouse. When the user adds a new bookmark by pressing the *New bookmark* button that is connected to the thumb, an editable bookmark appears next to the thumb. Bookmarks can be deleted by dragging them outside of the bookmark area or selecting *Delete bookmark* from the context menu. The *Show/hide bookmarks* toggle button located at the bottom of the bookmark area allows the user to select between showing all the labels simultaneously and only showing the label of the currently focused bookmark.
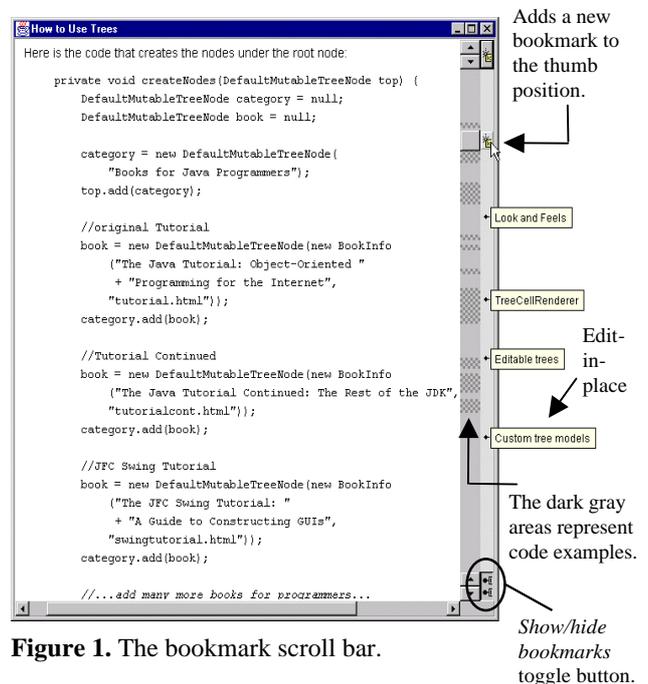
Figure 1. The bookmark scroll bar.

The structure of the document contents can be visualized on the scroll area. In Fig. 1, the locations of the code examples of a Java Tutorial lesson [5] are shown.
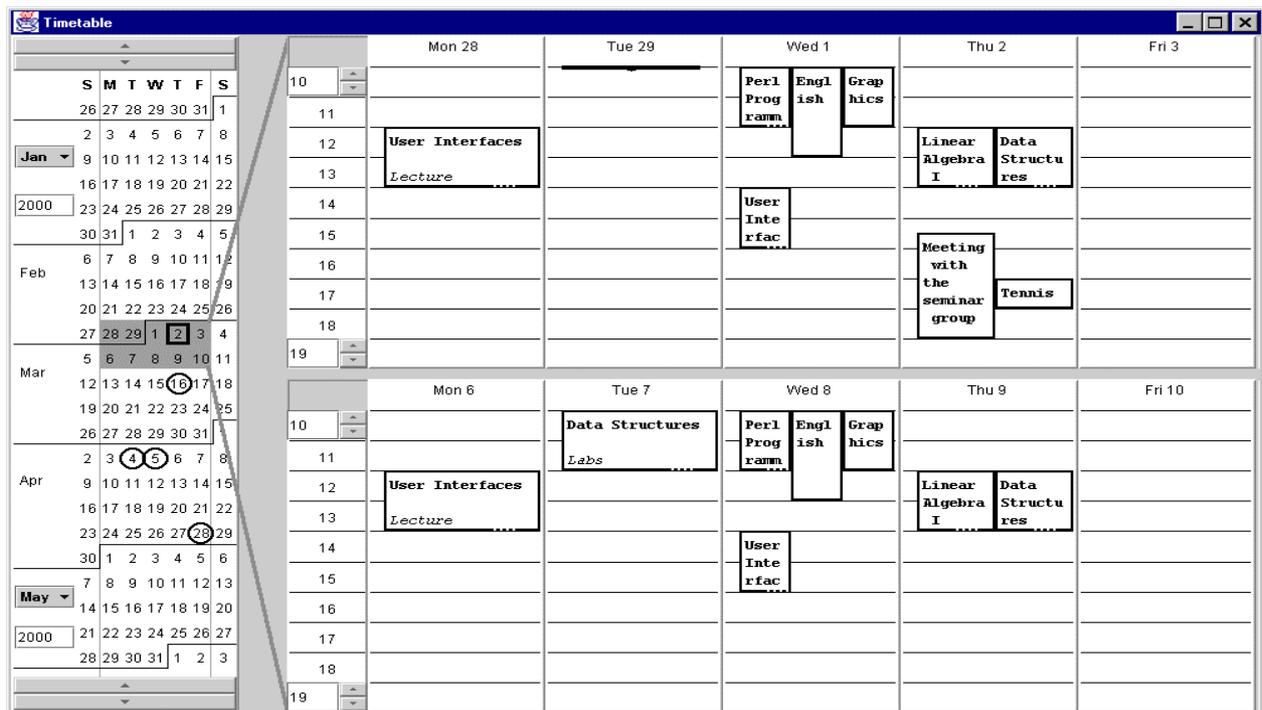
Figure 2. The calendar scroll bar.

CALENDAR SCROLL BAR

One of the recurring user interface design problems is to offer a flexible calendar view that can be intuitively and directly manipulated by the user. During the design of our calendar scroll bar we have emphasized maximal visibility and direct manipulation of the time range: everything can be adjusted in place. Figure 2 shows an example of its application; the user, a university student, creates her timetable for the entire Spring term.

The thumb of the calendar scroll bar (the dark grey rectangular area in Fig. 2) can be dragged with the mouse to another position. The size of the thumb can be directly increased or decreased by dragging its borders with the mouse, and the corresponding schedule view is updated continuously. Double-clicking the thumb brings it back to its original size at the clicked position.

The calendar scroll bar can visualize events or some attributes of them. In the example of Fig. 2, midterm exams are shown as circles.

FUTURE WORK

Currently, the calendar scroll bar supports only continuous selections. We are working on discontinuous selections, which would be convenient in many cases, e.g. when the user is interested in three problematic Wednesdays for which she should schedule meetings.

The current prototypes have been used and tested by computer science students, and the initial feedback has been very encouraging. We are currently preparing more structured and formal usability testing.

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