Enhancing the Reading Experience: Sonified On-Line Speed-Reading from a PDA Screen Using RSVP

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ABSTRACT

Decreased display size on PDA's and WAP phones may create usability problems when the user is engaged in inormation retrieval tasks, such as reading a long text document. The RSVP speed-reading paradigm for silent reading of on-line text was implemented on a PDA. Text presentation speed, character size as well as window width can be varied in the application. By linking scalable audio in the form of nomic or representational soundscapes that matches the content of the text appearing in the RSVP text presentation window at any reading speed, it might be possible to further enhance self-paced reading experience.

Keywords

RSVP, information retrieval, comprehension, PDA, speed-reading, on-line reading, Web, handheld computers, earcons.

1 INTRODUCTION

The readability of text presented on large computer screens has attracted a lot of attention during recent years. The present paper considers readability from a small PDA (Personal Digital Assistant) screen using the RSVP (Rapid Serial Visual Presentation) paradigm. The decreased display size creates difficulties when the user is engaged in information retrieval tasks, such as reading a long document (e.g., a novel) from the screen, which requires a lot of *within* page scrolling. A system and a method for adding sound to the silent reading experience are also proposed.

1.1 Static Versus Dynamic Text Presentation

The most common medium for text presentation is paper. The text layout is usually presented according to the same static metaphor on a computer screen as on paper. The only difference is that instead of the text being parsed into paper page units, a scroll bar or turn-page keys are used for turning the pages. Turn-page keys are implemented in electronic books such as the Rocket eBook (2000). Reading text from paper is usually 20-30% faster than when reading the same text on-line from a *large* computer screen (Mills and Weldon 1987). Number of lines displayed (display height) does not affect reading speed largely whereas width does. Reading speed increased by 28% when changing from narrow one-third-screen width to full-screen width (Mills and Weldon 1987). Rapid Serial Visual Presentation, RSVP, dynamically *presents text that is chunked into one or a few words at a time at a single visual location.* This way of presentation eliminates the need for eye movements during reading. Juola et al. (in Mills and Weldon 1987) report that for equal reading rates, comprehension in the RSVP mode was similar to

page mode comprehension. RSVP implementations for large screens are available on the Internet today (Cornix 2000, Vortex IV 2000). It thus appears that RSVP of long text documents (e.g., a novel) could be a good candidate when display size is small and the user is on the move and lacks printing facilities.

2 IMPLEMENTATION

A RSVP prototype, *Reader 1.0,* was implemented. Using PersonalJava™ the RSVP paradigm was implemented on a Casio Cassiopeia E-105 (figure 1). The Cassiopeia is a standard Windows CE based Palm PC. It features a small 4.5-inch colour screen with the resolution of 240 x 320 pixels (portrait mode).

Figure 1: The Casio Cassiopeia E-105 with the Reader 1.0 RSVP application running.

Figure 2 shows the prototype interface of the RSVP *Reader*1.0. By the menu bar at the top of the interface the user can choose; type of text to display, the length of the text sequence shown at one time (text window width), the speed level at which the text is displayed (in 27 steps between app. 25-1000 wpm) as well as font size. Beneath the menu bar, information is displayed regarding the title of the text and the current settings regarding Length (17), Speed (level 3) and Font size (12 dpi). The text appearing in the presentation window is always aligned to the left. The application reads from the selected text file and presents text sequences that match the selected text window width. After punctuation delimiters in the text (., !, ?, :, ;), there is a blank text window (250 ms in duration) in order to improve comprehension. In order to enhance self-paced silent reading experience when interacting with electronic media, would it be possible to link non-verbal *soundscapes* (coined by R Murray Shaffers) to appropriate passages in the text? Non-verbal soundscape earcons (Gaver 1986) are then played back to the reader when the text linked to it is displayed in the presentation window in the RSVP paradigm (Goldstein et al. 2000) at any selected reading speed (TimeFactory 2000) in order to enhance the reading experience.

Figure 2: The user interface of the RSVP Reader 1.0 implemented on Windows CE.

3 REFERENCES

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