Rapid Serial Visual Presentation

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ABSTRACT
Rapid Serial Visual Presentation, or RSVP, has tremendous potential to support electronic information browsing and search. Our video presents a number of animated simulations of how RSVP could support these activities. These examples illustrate the potential of RSVP to be used for the assessment of content in situations in which a user asks "What's there?", or "Is it here?". Our video also shows how RSVP can help with navigation on the Web. A number of research issues are discussed.

Keywords
Information Navigation, Information Retrieval, Interaction Design, Rapid Serial Visual Presentation, GUI, HCI, CHI.

INTRODUCTION
You go into a bookstore, and see what might be an interesting book. What do you do? You probably pick it up and riffle its pages. Seeing each page for about a tenth of a second allows you to assess its contents. Riffling a book is just one of many forms of Rapid Serial Visual Presentation, or RSVP. Electronic riffling is possible and has been explored, for example, in a video-on-demand browsing systems [3], a shopping service [6] and dynamic key frame presentation for video browsing [5]. However, the potential of RSVP for electronic information browsing and search has yet to be fully exploited. Our video presents ideas, described below, about how RSVP can be applied to support these activities, highlighting several issues which need to be investigated before RSVP might reach its full potential.

Browsing
Browsing has been defined as the assessment of content [4]. A typical situation demanding browsing activity is one in which a user asks "What's there?". Thus, someone who has filed a number of photos may come across a folder whose name conveys little about its content, and may wish to explore that content. By virtue of people's ability to rapidly recognise distinctive images [1,2], viewing each of the photos contained in the folder for just a brief moment, while they are displayed using RSVP, will allow the user to form a mental model of the folder's contents.

Search
Search can be defined as 'weighted browsing', in which content is assessed until one sees a match of what one was looking for [4]. A typical situation demanding search activity is one in which a user asks "Is it here?". Search implies that the user has some idea of what "it" is the user is trying to find.

Our video shows, in a simulation, how RSVP could be applied to search for a specific photo that could be stored in any one of several folders. An RSVP gadget in the form of a magic lens could be used to assess the content of each folder until the photo is found. The magic lens can be dragged and dropped onto a folder. A small RSVP window appears in which each photo in the folder is displayed for 0.2 seconds followed by the next photo. An RSVP control allows the user to stop and restart the RSVP stream and, after the RSVP stream has been stopped, the user can move forward or backward one photo at a time. An indicator shows the proportion of the folder's content that has been displayed.

Web Navigation
RSVP might also be used to assist in navigation on the Web. Web browsing often starts off at a web page of interest and asking "where can I go from here?". By following the links to the index pages of other web sites (outlinks) the "neighbourhood" of the start-off page is being explored and the page is put in context.

Our video shows how RSVP could be used recursively to help in Web navigation. Starting at a page of interest, each of its outlinks is represented by an image showing the top section of the linked index page. Index pages, and especially their top sections, are generally distinctive enough to be recognised when presented for only a very brief moment, even when these page samples are severely reduced in size. When the user decides to explore the neighbourhood of a page of interest, these images are

displayed using RSVP. The RSVP stream can be paused and restarted using a control that also shows the relative position of the currently displayed image. When a potentially interesting page is spotted, the neighbourhood of this page may, in turn, be explored by the rapid presentation of its outlinks. A coloured circle then represents the neighbourhood of the original start page. After this process has been repeated several times, these coloured circles represent the history of the browsing process showing how web sites are related to each other. This representation of a history of the user's activities allows for easy backtracking.

Research Issues

RSVP is particularly useful in situations in which there is too much material to display simultaneously in full. Provided that each image can be presented sufficiently briefly and still be recognised, the time to browse a large volume of images may well be acceptably short. Our assessment is that RSVP may be particularly useful for browsing between 20 and 200 images. However, user evaluation is needed to determine the range in the number of items for which browsing using RSVP would be useful. We are currently investigating the importance of a number of additional variables in the applicability of RSVP. Two of these are discussed briefly below.

Static versus Dynamic RSVP

Static RSVP refers to a method of displaying in which all images are displayed more or less in the same location. Each image in a static RSVP stream is, therefore, visible only until it is replaced by the next image in the stream. Dynamic RSVP, on the other hand, refers to a method of displaying in which images may be displayed at several locations. Each image in a dynamic RSVP stream may, therefore, still be visible even when new images are being displayed and, as a consequence, presentation rates may be higher. An example of static RSVP is the video-on-demand browser [3], whereas the shopping service of [6] is an example of dynamic RSVP.

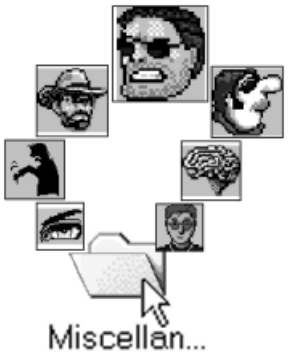

Figure 1
Time-slice of a dynamic RSVP

Our video includes examples of both static and dynamic RSVP. In our implementation of dynamic RSVP (Figure 1), images move clockwise out of one side of the source item into the other side. One possible advantage of this particular method of presentation may be that by fixating on the top centre frame, each image moves in and out of the area of focus and the resulting peripheral pre- and post-views may enhance image recognition.

Presentation Rates

The usability of RSVP may be critically dependent on choosing the appropriate rate of presentation. No doubt, the nature of the images the user is browsing has a substantial influence on the optimum presentation rate, but other factors such as how well the user knows what he/she is looking for will also play a substantial role. Searching may be done at much higher presentation rates than browsing. This hypothesis is based on the findings suggesting that, above a certain rate of presentation, pictures are momentarily understood at the time of viewing and then quickly forgotten [2], which would allow detection, but not the formation of a mental model.

CONCLUSIONS

Supporting the activities of electronic information browsing and search is becoming more important with the growth in the amount and variety of electronic data. We conjecture that RSVP can support these activities and we see it, therefore, as important to develop its potential. Here we have presented some ideas of where RSVP could be usefully applied. Assuming that some of the research questions can be successfully answered, we are sure that many more applications of RSVP will be developed in the future.

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