

Formative Evaluation of a Focus + Context Visualisation Technique

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ABSTRACT

We describe a formative evaluation of a prototype image browser based on *flip zooming*, a focus+context visualisation technique. The technique was contrasted with two other methods to view images on the Web. The evaluation showed that users appreciated the overview that the flip zooming prototype provided, although some found the display confusing.

KEYWORDS

Focus+context, formative evaluation, image browsing, information visualisation

INTRODUCTION

Despite the advances in human-computer interface research during recent years, the basic channel that is used for communicating information from the computer to the user has remained the same: a screen. How can one present the large amounts of visual information that now is available from large databases, the internet, etc., so that users can keep an overview, and not get lost in the details?

A promising set of techniques, collectively termed focus+context visualisation, can readily be applied to real-time computer graphics displays. These techniques are based on how human vision works, in that they show the centre of attention – *the focus* – with a high amount of detail, while showing the surrounding information – *the context* – with much less detail. Below, we describe the evaluation of a novel focus+context technique, which we hope will be a step towards solving the problem of displaying large amounts of information on small screens.

THE FLIP ZOOMING TECHNIQUE

We have called our technique flip zooming (Holmquist & Ahlberg 1997). Users navigate through a data set by “flipping” through it, like the pages in a book. When users want to examine an entry, such as an image, they select it by clicking on its thumbnail representation. It is then zoomed to a readable size and the surrounding thumbnails are re-arranged to accommodate the new focused image. When users want to view a new entry, they either click on its thumbnail representation, or “flip” to it using a GUI command or a keyboard shortcut.

EVALUATION

The evaluation was designed to determine if the flip zooming technique offered the advantages that we hoped: good overview and fast access to the details of a large material. We also wanted the evaluation to detect any flaw in the technique and/or the design. The evaluation was *formative* in that it would affect the evolving design of the technique. The evaluation contrasted our prototype with two other image

browsing methods by using a number of contextually different tasks. Open-ended interviews were conducted to collect as much and as diverse data as possible.

Two image sets were used as a basis for the evaluation: A set of lecture slides (34 images) to be read in order, and a set of photographs of various animals (30 images) which contained no inherent ordering. Apart from flip zooming, we used a frame-based web-page, generated by Microsoft's PowerPoint application; and Adobe's Acrobat Reader for PDF files. 10 users performed a number of tasks on the different systems and were asked to describe the strengths and weaknesses they had found. The comments were then categorised by us. In the table below, those points which were mentioned by at least 50% of the subjects are listed.

	Flip Zooming	PowerPoint Web Page	Acrobat Reader
Strengths			
Good overview	10	3	1
Alternative search methods	0	8	0
Clear structure	0	0	5
Weaknesses			
No / too small thumbnails	5	0	9
Unclear structure	5	1	0

Table 1: Strengths and weaknesses of the systems, as stated by 10 users

As can be seen, all users said that flip zooming provided a good overview of the material. None of the other system was described as giving a good overview by a majority of the users. 5 users thought that Acrobat Reader presented the material in a very clear way – several users spoke of it as “neat and tidy”. 5 users thought that the flip zooming image browser's way of presentation was confusing and gave no clear indication of the structure of the presented material.

CONCLUSIONS AND DISCUSSION

Our main conclusion from the evaluation is that flip zooming provides a good overview and that a clear structure is important to users. The evaluation also indicates that it is a good idea to consider a trade-off between information density and clarity. Using thumbnails that are placed in a efficient but confusing way may not be as useful as using a well structured display with slightly less information.

The evaluation has encouraged us to pursue the work with flip zooming and has pointed out areas for possible improvement. We feel confident in concluding that flip zooming provides a good overview, but that the presentation will need more work to convey the structure of the material clearly. We believe that focus+context methods are useful when display space is scarce, and that flip zooming presents a realistic alternative.

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