COMP3013 Conference Computing - Displaying Web Content on Small Displays

Chris Lord
Southampton University
cil103@ecs.soton.ac.uk
http://chrislord.net/

Abstract

The majority of web content is not suitable for viewing on small displays. In this paper, three different categories of web content manipulation to make these pages more accessible on small screens are documented, along with their strengths and weaknesses. These methods include layout manipulation, content manipulation and display techniques. Some information is provided on what methods are employed by current mobile web browsers and a suggestion for combining these ways of reformatting and display is also proposed.

Keywords

Information Visualisation, Small Screens, Web, CSS (Cascading Style Sheets), DOM (Document Object Model)

1. Introduction

Due to the increasing popularity of PDAs and convergent devices such as smart-phones, the world wide web is seeing increased access on devices with lower resolution and physical area than common desktop displays. Most content on the web was created in mind of being displayed on a desktop computer and not the smaller displays found on these devices.

Some sites choose to deal with this by detecting access by devices with constrained viewing area and redirecting the browser to a page reformatted manually and specifically for smaller screens. Other sites use proxy services and provide the main content of their site via different methods more tailored to small screens, usually by a linear transformation[3], where the content of the site is summarised and provided in a long linear list.

The problem with these previous methods is that they require the creator of the site to specifically cater for a subset of their users. There is a multitude of content on the web that is not suitable for direct migration to devices with small displays. These are rendered almost unusable due to assumptions made about the display size.

This paper intends to provide detail on some of the techniques used at client-side in browsers, such as intelligent content extraction, styling and customised display techniques, to make pages intended for use on large displays more accessible on smaller displays. It also intends to suggest what may be the ideal combination of these techniques and to provide some reasoning behind this suggestion.

2. Issues with Page Layout and Content

There are many specific issues to overcome regarding the layout of web pages for small screens, as well as the actual content of pages. There is a finite amount of information that can be fit on a particular screen size, based on the text size that is comfortably readable[2]. Often web sites are designed with a set width and the text is set to fill this width. This becomes a problem when resolution and/or dpi (dots per inch) vary too far from that which was in mind when the page was designed, and may require the user to scroll back-and-forth, for example[4].

There is also the issue of the positioning and size of page elements. A common layout style is of a 3-columned table, where the centre column contains the main content and the surrounding columns contain relevant links and adverts. This presents a problem as screens on common portable devices often have either a square aspect ratio, or an aspect ratio that has a larger vertical component than horizontal. Images, for adverts or otherwise, are often created with the assumption of a particular resolution and dpi that is incompatible with most devices with small-screens as well.

Finally, there is the issue of the content chosen to be displayed on a page. When screen space is limited, it is important to include only the information necessary. Adverts, comments and other such irrelevances, when placed in a prominent position, can make a page difficult to navigate with a restricted input method or on a small screen.

4th Annual Multimedia Systems, Electronics and Computer Science, University of Southampton