Title: Web Browsing For The Visually Impaired
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1 Background

Much of the web pages on the World Wide Web is targeted at the sighted, and are not designed to be accessible to the visually impaired. The Web Accessibility Initiative has put forth a set of guidelines [1] that will help in designing web pages that will be more accessible by all people including the blind. However most designers of web pages do not follow these guidelines.

1.1 Present Technology

Much of present technology has been directed in providing the visually impaired access to the Internet. Generally speaking there are two types of approaches to browsing the World Wide Web, screen scrapers used in conjunction with main stream web browsers and specialist browsers. Screen scrapers transform a web page into audio output by parsing the page from the top left hand corner to the bottom right. Users of screen scrapers face difficulty when confronted with pages designed using complex layouts. Frames, tables and pop-ups are all visual presentations and can prove confusing to the visually impaired as the audio output form the screen scraper would not be in a linear flow. Specialist browsers attempt to manipulate HTML to be more user friendly for the visually impaired. However these do not have extensive support for features as compared to main stream browsers like Microsoft’s Internet Explorer.

1.2 Traveling

Going from one website to another has been likened to traveling. Travel in cyberspace has two portions Navigation and Orientation [2]. Navigation is that portion of travel where the user moves from a known point to another. Orientation is the user trying to orientate to the environment; knowing the spatial relationships between one web object and another. For the sightless, both prove to be obstacles. The World Wide Web remains a visually oriented domain, with most pages built using visual cues. This makes the sight impaired orientation process difficult, and this makes navigation worse.
1.3 Traveling obstacles for the Visually Impaired

The visually impaired use mental maps to orientate and navigate. In order to build a mental map of a web page, the user has to listen or feel the entire page. This is a time consuming process and can be made worse by pop-ups and complex layouts.

There is also a need to constantly orientate one’s own location. This is done via using web objects on the page as landmarks. However with a non linear flow in complex layouts employing tables and dynamically changing content, it will be difficult to establish and locate the landmarks.

The visually impaired rely on predictability to help in their traveling process. This is because of the time it takes to listen or feel the web page. There is a need to rediscover and map each page, this impacts on the willingness of the user to travel in unfamiliar sites.

2 Aim

The aim of the project would to be build a working solution that will help the visually impaired orientate and navigate. This working solution will attempt to reparse web pages into a form that is more friendly to the visually impaired. This assistive technology should be able to work with present technology. The aim is create a re-parsed web page in a standard form to allow the user to quickly orientate and focus on the objective of deriving information.

3 Method

Our approach is to adapt and derive methods to re-parse a web document that a user can read with screen scrapers.

The first area of interest is the re-parsing of normal HTML elements. Algorithms must be devised for parsing constructs such as tables and frames into a hierarchical form.

The second area of interest is the adaption of technologies such as Java script into a form readable by screen scrapers.

The last area of interest is developing ways to intelligently reformat web pages. Web pages can be divided into several logical sections namely Document Information Section, Logical Heading Section, Logical Footer Section, Index Section, Logical Data Section, an Interactive Section [3]. These are built using similar HTML constructs. In order to properly reformat a page, these sections must first be located successfully.

4 Software and Hardware Requirements

No Special Software and Hardware is Required
### Table 1: Proposed Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Semester</td>
<td></td>
</tr>
<tr>
<td>Research on algorithms and Obstacles to blind</td>
<td>4</td>
</tr>
<tr>
<td>Submit revised proposal</td>
<td>11</td>
</tr>
<tr>
<td>2nd Semester</td>
<td></td>
</tr>
<tr>
<td>Conduct Usability Testing</td>
<td>8</td>
</tr>
<tr>
<td>Submit Dissertation</td>
<td>12</td>
</tr>
<tr>
<td>Present Seminar to Seminar Panel</td>
<td>13</td>
</tr>
</tbody>
</table>

### References


