
ABSTRACT

The 'Towel' project seeks to find solutions to problems encountered by visually impaired users when travelling in the World Wide Web by leveraging solutions found in real-world mobility¹ and applying them to the virtual world. Visually impaired users find mobility on the Web particularly difficult because of the reliance of hypermedia on visual layout and large viewable areas that facilitate and enhance sighted mobility. Hypertext design and usability has traditionally concentrated upon navigation and orientation to facilitate this mobility; consequently other aspects of travel are neglected and Web mobility has suffered. Similarly, the Web Accessibility Initiative (WAI) Guidelines do not take a holistic view of travel and therefore in both these cases a fully rounded view of mobility cannot be formulated.

This thesis seeks to address these issues by extending current guidelines and design methods to include the real-world mobility concepts of orientation, memory, environment, preview and the purpose of the task at hand. It examines travel from the perspective of a model of travel in virtual environments, to a framework for analysing travel needs in a virtual environment, guidelines to include travel within virtual environments, and proposes methods to encapsulate travel on the World Wide Web. These methods lay along two tracks:

1. **Server Side** - Development of a mobility framework so that mobility items within the Web page can be defined and manually identified by inserting specific bespoke mobility mark-up into the page.
2. **Client Side** - The implementation of a mobility client side user agent, designed and derived from the application framework, to automatically manipulate the mobility mark-up in a way that is useful to visually impaired users.

¹ Mobility is the ease at which travel can be accomplished, and also refers to items which are used to accomplish this travel.