HaptiMap, Haptic, Audio and Visual Interfaces for Maps and Location Based Services

HaptiMap has performed novel and original research into multimodal perceptualizations. We have investigated how, and in what ways, multimodal feedback can both augment and replace visual feedback for diverse users in diverse situations. The results of this research has been published both as research reports and as guideline documents and it has been encapsulated in the HaptiMap toolkit and the HaptiMap demonstrators. Research in HaptiMap has been performed in a user centred way - during the initial studies 221 users participated in different research activities. Formative evaluations during the development has involved 113 individual users. Our final evaluations involved 392 users (including 27 developers evaluating the toolkit). Thus our results and recommendations are based on a substantial body of evidence. Check out the HaptiMap video for a quick introduction.

The HaptiMap guideline documents are:

- User Study Guidelines , a guideline document which provides an easy to read overview of the why and how of user centred design for mobile applications, and includes descriptions of a wide variety of different user study techniques.
- User requirements and design guidelines for map applications , is a guideline document intended to support and inspire the design and development of good map and location based applications. We provide both general observations as well as more concrete and detailed suggestions - many of these are applicable for any design intended to be used in mobile contexts. Our recommendations and suggestions are applicable to a wide range of use situations, but we have a particular focus on the pedestrian situation.

- Accessible map and LBS content guidelines. These guidelines aim to support data providers so that they are able to collect and store appropriate information. The aim of this deliverable is to raise the awareness of accessibility issues and help the map data providers decide what information should be stored and how.

The HaptiMap toolkit allows software engineers easy access to the HaptiMap multimodal components. It was designed for all mobile and desktop platforms but has found most favour on Android and iOS. On these two mobile platforms there are a number of directly 'pluggable' components such as the tactile compass, the Geiger compass, the touchover map and the activity recogniser.There is a rich support system available for the toolkit, through either a Wiki, a forum or a help ticketing system. Examples of toolkit use can be found in the demonstrators and in the entries to the HaptiMap developer competition. The toolkit has also been found useful as a tool for teaching students of computer science, interaction design, and engineering. It is also finding its way into research projects in the area of connected health and assisted living. The toolkit has been successfully evaluated by external professional developers who found it easy, useful and also stated that it was well ahead of any other systems currently available.

The toolkit includes two specialist APIs:

- LocPP-API/Joined API for iOS and Android is an extract of the JOINED functionality which allows developers to embed 'friend finder' technology into their applications A technology that is endowed with optimized (through our research findings) tactile and audible multimodality. LocPP API has been developed as part of the toolkit, but for marketing purposes it has been branded as the JOINED AP. The only difference is that the JOINED API comes together with a working server (i.e. the backend that manages users positions) provided by GeoMobile. Developers can implement their own server and use LocPP for free. Or they use the JOINED API together with the JOINED server backend and pay a certain fee for using the server.

- The SCPN API (Safe Corridor Pedestrian Navigation) is specifically designed for pedestrian navigation applications where non-visual interaction and the avoidance of obstacles are of paramount importance. More information can be found at the iOS part of the HaptiMap wiki .

As part of the HaptiMap project, demonstrator applications have been developed for Android and iOS by using the toolkit.These demonstrators illustrate one or more different HCI concepts that have been designed as part of the project. The demonstrators that were released to the app stores have achieved several thousand downloads, spreading the idea of the project to more users than ever could be reached with traditional methods.

In HaptiMap we have also done original work aimed at supporting industrial design and development by providing tools that support the inclusion of a wide range of users and contexts in the design process. The HaptiMap context card bundle is a versatile tool that can be used during all phases in a design process. The context cards are complemented by a workbook containing background information, practical advice, additional design methods as well as a workshop template developed to fit well in the industrial setting. Under design tools you find guidelines and checklists, information on simulation and prototyping tools, standards and regulations as well as evaluation materials and the evaluation tool available through the HaptiMap toolkit: the Virtual observer.

Want to learn more? Welcome to the HaptiMap training site: http://www.haptimap-training.org/ (opens in a new window).

A four page text describing the work done in HaptiMap can be found in the HaptiMap final overview .

The HaptiMap project has now ended, but please follow us on the HaptiMap facebook page: https://www.facebook.com/Haptimap

About HaptiMap