Mobile Users and Extra-spatial Context

Rainer Malaka

European Media Laboratory GmbH

Schloss-Wolfsbrunnenweg 33
69118 Heidelberg

Abstract: Information systems for mobile users need additional context information for delivering location based services. In simple systems, this additional context is just given as spatial coordinates. For more complex and intelligent systems, more detailed models of both the spatial context and user situations are needed. -To make such models formal, explicit and sharable, e.g. by means of ontologies, is still a challenging matter. Ontological descriptions of spatial context could be used in various ways for understanding user needs and customizing semantically described services and information objects.

In a number of research projects, mobile systems have been developed that aim at assisting users in their everyday tasks. These models vary in a number of parameters and range from simple location based data look-up to very complex multi-modal interactive systems that can communicate through freely spoken language. Some of these ideas even made their way out of research labs into products that can be bought off the shelf.

One of the most cited arguments for specialized mobile "location-aware" systems is that due to interaction restrictions in mobile situations, such systems need to tailor information and minimize information overload. A mobile user may, for instance, have limited time, little real estate on the screen, and has no keyboard when searching for some restaurant near-by. The system can facilitate the search by just displaying the restaurants in the vicinity.

However, such a simple approach falls short in realistic and complex situation. Many tasks are not only related to the location but rather to a complete situation of a user. Such a situation may include intentions, nested tasks, goals, roles and other factors. In the Smart Web project we employ ontological models for the context of a user, including navigational tasks. These models are then used for assisting mobile users in accessing the Semantic Web. The information on the user context can not only restrict queries to location-dependent queries but it can take into account a whole number of additional context factors, e.g., a user can ask for directions and the system can infer from the context that the since user came by motorcycle, has time and the weather is fine, he might prefer a fun route over an efficient one. Moreover, domain ontologies can help to disambiguate user utterances in dialog systems and they can be used for intention recognition.