

Title	地図上の目的地選択を支援するルートの視覚化
Author(s)	大内, 宏之
Citation	
Issue Date	2008-03
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/4264
Rights	
Description	Supervisor: 國藤 進, 知識科学研究科, 修士

Supporting Destination Selection by Facilitating Route-visualization on the Map

Hiroyuki Oouchi

School of Knowledge Science,
Japan Advanced Institute of Science and Technology
March 2008

Keywords: information visualization, map navigation, route information, mobile-device

In this research, we propose AwarePath a technique to visualize information that supports the selection of route on the map. This Masters-Thesis which mainly reflects the research work on AwarePath consists of seven chapters.

Uses of mobile-device such as cellular-phone to view maps and routes are all time increasing. However, as the screens of the mobile devices are usually small it is very difficult to display the whole information of the map on such devices.

To combat the spatial problem technically, two different techniques “Overview&Detail,” and “Focus&context” had been proposed in the past. Among them, “Overview&Detail” technique tries to solve the problem by displaying overall view and detail view of the target simultaneous. On the other hand, “Focus&context” technique arrange and display whole context and focal point spatially by combining them accordingly. However, it is intuitively difficult to understand the route displayed on “Overview&Detail” unless the users correspondence both overall view and detail view proficiently. Moreover, “Focus&context” technique emphasize more on focal point and give the impression of distorted vision and make it more difficult for the users to gauge the distance. Therefore, the previous approaches taken to combat the spatial problem were not really solved.

There are some other methods such as “Arrow,” “Halo,” and “CityLights” that maintain users’ perception as well as demonstrate the offscreen destination by providing the portion of the map information while displaying the route results to the users. As above mentioned methods, provides the portion of map information in a very understandable manner it is easy for the users to make preferences on selection the destination. However, existing systems such

as “Arrow,” “Halo,” and “CityLights” has some drawbacks as they do not provide any route information to the users. Therefore, they do not provide reliable information on real situations where route based destination retrieval is vital.

Therefore, in this research, we mainly focus on to solve the existing problems in destination selection by improving the efficiency of route visualization on mobile devices. We hypothesize that it is easy to understand and follow the mobile device if route information from present location to final destination was included. And hence, we proposed AwarePath which provides route information to the users.

AwarePath is a technique which provides shortest visual route from present location to the final destination as well as make it easy for the users to presume the route by providing real-route information. AwarePath helps users to select reliable, easier, and shorter route on the map.

To verify the reliability and efficiency of AwarePath we conduct an experiment by selecting the proposed place on the map using AwarePath. This evaluation experiment consists of three different tasks: 1) Location prediction task, 2) destination order prediction task, and 3) route prediction task (between present location and destination). In Location prediction task, we asked subjects to predict the offscreen destination. In destination order prediction task, subjects were asked to predict the nearest destination in order by following two conditions namely direct distance and route distance. In route prediction task we ask subjects to predict the route between present location and final destination. AwarePath and Halo were used to conduct the tests. We apply the above mention three different tasks and later compared their results.

As a result, two different scenarios were noted. Firstly, AwarePath and Halo resulted in similar accuracy on those tasks which does not require route information. Secondly, on the tasks which require route information, AwarePath shows far more accuracy than that of Halo. In other words, we can say that, Halo is unreliable for the tasks which largely demand route information. On the other hand, AwarePath is highly reliable and can also be used in situations when route information is highly demanded. From the results, we can conclude that AwarePath can be used as a support tool to select shorter and reliable route on the map.