

MOMO SOFTWARE

Weekly Progress Report - March 8, 2011

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This week we worked on literature surveys. Each of us picked up an article about context awareness and we examined three papers on the subject. This report consists of their summaries.

Context Awareness by Analyzing Accelerometer Data by Cliff Randell and Henk Muller

This paper mentions the architecture and process of analyzing accelerometer data to extract information about user's activities. The system focuses on three topics: power efficiency, activity recognition and training for different users.

Firstly, they managed to build the system so that only when something different happened or the accelerometer sense huge changes, the main processor wakes up to complete tasks. Since our system is also needs power efficiency we need to pre-process the accelerometer data before they enter the activity recognition system.

Secondly, the paper mentions that by using only two axis accelerometer data they managed to extract many different motions such as walking, running, sitting, walking upstairs, downstairs, and standing at 90% accuracy. Since we have three axes accelerometer to work on we will be able to conclude at least same quality of information. Probably we will manage reach higher accuracies with more different actions being recognized.

Finally, all of these activities are user dependent. In other words, a person's walking could be same as another's running or vice versa. Therefore, training is necessary for the program to manage the activity recognition correctly. This topic is something we missed in the previous design considerations. Therefore we will add a training application at the first execution of the application to gather data from the user and match them to corresponding activities.

Design Issues and an Empirical Study in Mobility Oriented Service Development by Tetsuo Yamabe, Kiyotaka Takahashi and Tatsuo Nakajima

In this paper, main reasons of the usability degradation are researched and human factor issues on mobile interaction design are tried to be clarified. They aim to make user interface and system design easy to develop services on mobile without decreasing usability such as retrieving important information with less attention while on the move.

Some points in this paper are very useful for our project in terms of the similarity of problems. They have analyzed how a user's attention is affected in mobile environment due to environmental changes of user not only in terms of technical aspects but also psychological aspects. Moreover, they give an overview of the mobile service design framework which represents how it changes in a different environmental condition for easy usability. The paper has also mentioned that attentive user interface (AUI) technologies that can be very useful for our project.

They have used an experimental method to observe the user's behavior while on the move. According to the results of this experiment, some events and indications are determined to be unnecessary and also users would expect more convenience than authors think. For example, simply, blinking in green means "YES" and in red means "NO". That is, users want to interact with the mobile applications without learning all meanings of indications so that this kind of features should be implemented in graphical user interfaces.

Context-Enhanced Interaction Techniques for More Accessible Mobile Phones by Shaun K. Kane

In this paper, the possible problems that a user may encounter while using a mobile phone in abnormal environment conditions are explained. Moreover, the new and alternative points of views are described. Although the existing problems and existing solutions which we have already known are showed in the most part of the paper, we can analyze the problems and possible solution offers from the author's approach in the rest part of the paper.

Actually we see that the problems that they mention while using mobile phone in abnormal context are nearly same as our pre-defined problems that we kept in mind while writing previous reports. However, they offer some alternative problem that is carrying the phone in pocket and the alternative solution that is related with voice-output.

By reading this paper, we can see a different approach to the same problem that we can try to solve. Moreover, we benefit by their arguments. For example they offer a context-aware user interface that take into account the usage rate of keys of buttons and change the user interface according to this info. The other different point is letting the user to set his/her preferences by applying the explicit preferences logic. By this way, the user can set the maximum and minimum size of the window or button sizes.

Finally we can say that although most part of this paper explains the general concepts that we have already know, it is important and helpful to analyze the different points of view to the same problem. We can also analyze some new alternatives thanks to this paper.