Context Aware User Interface Project powered by MOMO

(Sponsored by ASELSAN)

MOMO Software consists of three members:

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Context Aware User Interface Project

Description:

Enhancements of user interface to increase the clarity of displayed information, to be faster, reliable, effective and accurate: We aim to produce an adaptable graphical user interface for different contexts, different light conditions and different colored environments. Moreover, interface will adapt itself while user is in a continuously moving state such as walking, running or in a moving vehicle etc.

Development System:

The project aims to produce software that works on mobile devices. Therefore, we choose Android platform that is based on Linux core and also an open source operating system. We plan to make our work available via 'code.google.com' or 'sourceforge.net' as open source.

Characteristics of the Project:

- We may use an accelerometer for activity recognition but not necessarily because activity can be recognized by the help of camera.

- As the color density of the environment changes, we plan to adjust color of the user interface according to the color density of the environment.

- Recognition of light density of the environment is another important issue for our project. Our aim is to supply a changeable user interface for different light densities and to make it more useful and viewable.

- Another topic that we plan to handle is activity recognition by using camera that has any resolution. Normally, moving the user makes difficult to view and understand the information on the screen. For the solution of this problem, we aim to create interface that is not affected by the user activity.

- According to the context, system adapts the followings:

  Size of the user interface elements (buttons, radio buttons, check box etc.)

  Font size

  Semantic zooming of the displayed information

  Layout of the UI

  UI's color

  Using only frequently used buttons on fast motion mode etc.

- Finally, our program will be capable of semantic zooming on map according to the activity of the user and the environment conditions. In other words, we want to use a non-graphical zoom that is a mechanism to do the view transformation from any view formats to the underlying meaning inside the target object. Moreover, it reaches into the derived data contained in the data table stage. We not only change parameters of a graphical representation but also modify the selection and structure of data to be displayed. In each zoom level, the program understands what the user intends to see and displays only that information -removes unnecessary ones-.

Proposed Final Work:

The goal of **Momo Software** is to design a user interface to increase the quality of displayed information and to provide users more effective interaction. We plan to demonstrate our final work on an Android-based mobile device such as a PDA or a tablet. We are aiming to handle at least the motion, the light and the color problems that worsen the effectiveness of the interface. To be more specific, the program will understand whether you are standing, walking or running, the environment is dark or bright and whether the camera is looking at the sky, to a forest or that kind of a specific colored area.

Market Research:

Although dynamic and adaptable user interface idea is not a new topic, there is no product specifically focused on this area. Most of the available programs have their custom interface capable of little adaptions by manual controls. Moreover, most of the mobile devices now have sensors that help adapting the brightness of the screen, accelerometers help rotating user interface etc. However, these are all general methods, they are not specific to programs and they mostly need user's direct commands. Our project aims to enable the programs to automatically change its interface to give user friendliness.

References:

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3. Tetsuo Yamabe, Kiyotaka Takahashi, "Experiments in Mobile User Interface Adaptation for Walking Users," ipc, pp.280-284, The 2007 International Conference on Intelligent Pervasive Computing (IPC 2007), 2007