Situated interaction in an educational setting.
Position paper

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Brief description:

At Computer Technology Institute Research Unit 3, we are dealing with education. Within this context we try to include in our research proposals situated interaction for learning activities. We do this by proposing

a)   at a lower level the use of different devices for different environments, and

b)   At a higher level facilitating the customization of learning by agent technologies.

We would like to see in the future the use of combined networked media (including interactive TV, PDAs, and mobile phones), for education.

Framework: A few observations:

The situation of use of several devices can be adapting to the environment and the situation in which they are used.

As a low-level example I can refer to things such as

- Mobile phones, adapting the volume level according to the environmental noise.
- Mobile domain devices (PDAs / car navigation systems / mobile phones) displaying context related information, such as tourist information for specific landmarks in the proximity, or navigation information in order to find specific points/items (in cities, public spaces, stations, airports, libraries, hospitals).
- Sensing proximity to start up an application or trigger a state of the device.

At a higher level, examples of contextual use are devices or applications that change behavior / input method according to the situation of use or according to what other devices are in the proximity.

- Concepts for interactive filming, whereby by passive interaction (such as pulse measuring), one can determine interest and adapt the dramatic plot accordingly so as to keep the viewers interest within a high level.
- Personal devices that recognize the existence of other devices and use them as input / output (for example a PDA that recognizes the existence of an unused screen in the area, and uses it to display information at a larger layout)
- Mobile phones that recognize the situation (i.e. you are in a meeting) and are able to filter the incoming calls accordingly (i.e. pass you only phones related to that meeting, or urgent ones)

Situated interaction in the service of education

At Computer Technology Institute Research Unit 3, we are dealing with education. We develop applications for education, as well as use our experience and knowledge taken from that area into different context, in order to develop several, other than educational, technologies.

Within this context we try to include in our research proposals the point of situated interaction for learning activities.

We do this by proposing

a)   at a lower level the use of different devices for different environments,

b)   at a higher level facilitating the customization of learning by agent technologies. Agent technologies can be used to deal with personalization issues as well as situation specific context of use.

We would like to see in the future the use of combined networked media (including interactive TV, PDAs, and mobile phones), for education.

A draft methodology we started with is:
a) Mapping the educational activities in the different spaces,
b) Using the characteristics of each space, for optimizing learning in each environment,
c) Seeing learning as a global activity within all environments.
Then breaking down an educational application scenario to different media, different information appliances, with different interaction methods according to the mood the user is in. The information presented can be tailored according to context of use.

We can derive many alternative scenarios of use, starting by defining the axis that we want to take as reference regarding interaction, user mode, situation of use, environment and environmental conditions

1. Interaction in devices can vary from active to passive, where active is a more focused and conscious action of the user, and passive is depending more on biomentric input, and tailoring the information presented by sensing the environment / area / context of use.
2. Users can be in various different moods ranging from: active to relaxed, energetic to tired, impatient (in a hurry) to patient, e.t.c.
3. Situations can vary from social (collective / public) to individual, from static to mobile, from virtual to real, synchronous to asynchronous, etc.
4. Environments can also vary: public (collective or not), home, mobile (transportation) environments.
5. Environmental conditions can differ: from light to dark, silent to noisy, dry to wet, hot to cold, colorful to dull. Interfaces may reflect those environmental changes in practical ways -such as screens adapting their brightness and contrast to the lighting conditions automatically-, or aesthetic ways -such as interface colors and style being seasonal or reflecting weather changes.

As already said, CTI's interest lies in education: the exploration of information/education appliances, in different context of use, and using situated interaction paradigms.

A student in the learning process moves between different environments: home, university, and transportation. Moreover a student can be moving in both real and virtual environments where learning takes place. Each environment is characterized by different social situations, as well as a different 'mood' that the person is in.
Each space may reflect different learning modes: more attentive - participatory at the university, more focused and concentrated when using the home computer, more passive when watching an educational video on the home TV.
Within each single environment situations can also vary, for example at home one can be in completely different moods: less attentive, doing several tasks simultaneously, or focusing in only one task only; In each setting one can be in a more private or in a more collective environment with others.

The landmark of the different spaces is mapped by a variety of devices: mobile devices (portable audio, mobile phone, wearable, PDA); home devices (TV, audio set, DVD, telephone, PC); Public devices: info-kiosks, phone booths, boards, screens / projections. Etc.

Moreover we can perceive in the future these different spaces having each their own network. Certain areas of the networks are overlapping.
- A personal network can be a network between PDA, mobile phone, audio set, laptop, or any other devices one may be carrying.
- The home network is linking together the devices in the home and distributes their content (stereo set, TV, PC, PDA, Camcorders).
- A university network can be linking public information devices (notice boards), computers, telephones, info kiosks, projection rooms.

We are currently in the preliminary stages of a research concept (concerning informal education) where we try to address customizable, situation dependant learning and integration of it in different platforms. The aim of this presentation is to evoke discussion and thought, about how situated interaction can be used so that learning in particular can benefit from it.