



The role of emotion in human–computer interaction

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Back in 2005, a number of courageous HCI researchers met for the first time for a workshop on emotion in HCI. Their intention was to share the thoughts, ideas, and – most importantly – problems they had with the vague, intangible, yet intriguing subject of emotions and their implications for human–computer interaction.

This first meeting had four main functions: showing what one has done, asking others their opinion, venting one's frustration at the increasing number of issues that arise when going deeper into the subject, and finally brainstorming possible solutions to some of these.

Following the success of last year's workshop we gathered again this year in London. The subject remained fairly wide and open: the role of emotion in HCI. Among the 27 participants were some from last year who happily reported on the progress they have made. The others were a broad selection from various fields: system developers, human factors researchers, multimedia experts, media designers, industrial designers with a foible for robots (and just a little knowledge about communication devices), psychologists with an interest in HCI, and HCI researchers with an interest in psychology. We all got on very well, found a common language (at least for the workshop), and worked together with joy and enthusiasm.

After very short introductions we discussed the issues most interesting to the participants and decided which subjects we should work on for the rest of the day. The following themes were identified:

Ethical and legal issues

From theory to practice: out of the lab and into the real world

Sensing and modelling

Affective applications and systems

Finally we formed three groups. The ethical and legal issues group was postponed for another occasion, since all, really all, saw the importance of this group but couldn't decide to join it.

The groups separated for the rest of the day and discussed their topics. Here is a synopsis of the notes from the workshop:

From theory to practice: out of the lab and into the real world

First we made clear that the drive behind our ambitions is to move out of the lab. We asked ourselves what value there is in affective computing (we agreed on that term for the time being) and came up with a few key phrases:

Increasing motivation

Increasing performance

Making products more attractive

Supporting social bonding and networking

Reassured that we were on the right path, we started thinking about how to approach real-life applications and found two ways: starting with the needs of the user and moving towards the application; and starting with the goal of the application and moving towards the user. We agreed that an in-out-in approach would be most practical: starting with users evaluating the whole application, going into the lab to scrutinise single isolated issues, identifying and improving specific parts of the application, testing the application again, going back into the lab and so forth. Although this doesn't look very scientific, we felt that this might be the best way to go on in the field and acquire more knowledge.

Sensing and modelling

The group began by discussing differences between emotion signals, modalities that carry signals, and sensors. We acknowledged that emotion signals are carried in one or more modalities (i.e. face, body, voice, physiological cues) and that more than one type of sensor may be necessary to adequately detect an emotion signal. The group agreed that a sensor is distinguished as the technology that captures a signal. It is not the job of the sensor to infer meaning from the signal. Currently, sensors are often intrusive and may interfere with natural behaviour. Once we develop a better understanding of affective signals it is important to develop sensors that fit naturally into our lives. We decided that, while developing sensors is technologically challenging, the inference of meaning from signals lies deep in the complexities of emotion theory and modelling. From this, we struggled with two key questions. First, does the ability to infer accurate meaning depend on task and context, or can inferences be made without such knowledge? Second, what is the best way to model a system with multiple affective modalities? More questions than conclusions were generated in this discussion. However, this group looked forward to continued discussions and collaborations throughout the year until we meet again.

Affective applications and systems

A broad range of possible issues were discussed: the role of emotion in systems, the desirability or otherwise of emotive systems, how to include emotion in systems, how to represent it, and so on. A number of potential application areas were also explored, ranging from games to driving aids to online shopping. We eventually focussed much of the discussion on one particular system, outlining how emotive agents may be able to help people improve their health, and explored some of the issues behind this specific application. These included how to represent the emotion, how to respond appropriately to users' emotions, and the ethical dilemmas of using empathy to affect people's behaviour.

At the end of the day the groups reported back to the workshop. We agreed on the following perceptions:

There are more questions than answers

Each answer has at least one question in tow

There are strong interrelations between most of the issues

Ethics must be addressed!

Finally the majority of participants expressed the wish to carry on discussions and keep in touch electronically as well as informally at other conferences. In addition, we decided to have a dedicated mailing list for this purpose.

After the workshop the group carried on discussions over dinner. The question of where to have dinner was fortunately answered beforehand by two caring participants who selected a very nice Turkish restaurant.

For those of us who didn't get enough, and for all others interested in the subject, there is now the mailing list, which can be signed onto via the workshop's website: www.emotion-in-hci.net. There you can also find the abstracts of the workshop contributions, photos, and personal impressions of the workshop. We look forward to another workshop on this subject in September 2007!

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