

The Role of Emotion in Human-Computer Interaction

Christian Peter
Fraunhofer Institute for Computer Graphics Rostock,
Dept. Human Centered Interaction Technologies
J. Jungius Str. 11, 18059 Rostock, Germany
cpeter@igd-r.fraunhofer.de

Gerred Blyth
Amberlight Partners Ltd.
Enterprise House, 59-65 Upper Ground,
London, SE1 9PQ, UK
Gerred@amber-light.co.uk

Emotion is underrepresented in HCI, despite its obvious and demonstrated importance. Any attempts to expand the field have suffered from being anecdotal or lacking any systematic approach. This workshop aims to bring together practitioners and theorists to develop a common research framework and vocabulary, and replicable design processes for continuing work in this vital field.

Keywords: Emotion, HCI, Affective systems, Design processes, Research frameworks.

1. INTRODUCTION

This year's conference topic is "The Bigger Picture" of HCI and covers subjects like tangible interfaces, pervasive computing, business models, and user group specific design. One aspect missing from the "big picture" is the perhaps most human part of HCI – emotion. This should be a key element of a discipline studying humans interacting with computers. After all, the goal of all our research and activities in the field of HCI is to make the user *satisfied*, to avoid *stress* and *frustration* using computers, to make the user *happy* or *pleased* to have accomplished a task, and maybe even to give him some *fun* or *joy*.

HCI is a very large field of research, with its roots in computer graphics, operating systems, human factors, ergonomics, industrial engineering, cognitive psychology, and the systems part of computer science. Other disciplines have been welcomed, such as the arts, anthropology and ethics, and new HCI-specific sub-disciplines have evolved, like task analysis or usability. They all are intertwined, enriching each other with their different ideas and approaches. They have in common that they all aim to improve the way humans interact with or through computers. But although the human is in the centre of all their efforts emotions, a key "property" of humans, have so far been widely neglected.

It has been demonstrated that emotions influence people's attitude towards their current and next action and there is evidence that they play an essential role in rational decision making, perception, learning, and other cognitive functions [6]. HCI activity, both commercially and academically, should reflect this fact. Some work has begun in this field, such as the theorising and anecdotal work of Don Norman [5] and Pat Jordan [4], and there is some development of a community covering this field [2], [3]. However, there is a real sense that this work is very disparate, and doesn't yet share the common vocabulary or framework that a mature discipline requires.

Early emotion-related activities in the HCI context concentrated on testing whether it is at all possible to "measure" emotion, either by taking physiological data of the user, or by less obtrusive measures, such as voice signal analysis or gesture and mimics analysis. First attempts of emotion aware applications confine also on mere tests if and how emotions could be included in existing applications or artefacts. However, there seems to be no rigorous footing for HCI-related emotion research, let alone a general concept of how emotions should be treated within HCI and its sub-disciplines. But, As Gilbert Cockton made clear in [1], it is necessary to clear up those theoretical issues in advance before any other steps towards affective computing can be sensibly made.

This workshop wants to take on the challenge by discussing theoretical fundamentals of HCI-related emotion research, emotions' function in HCI, and also practical implications and consequences for the HCI community.

Topics addressed by the workshop are:

- How do HCI people define "emotion", and are all emotions of interest to HCI?
- Which function do emotions have in HCI and can we develop an actionable framework to support it?
- Which opportunities and risks are there?
- How applicable are research results from other disciplines, is there need for HCI specific emotion research?
- Are there reliable and replicable processes to include emotion in HCI design projects?
- Can we solve emotion related issues within the HCI domain, or do we need support from other fields of computer science or other sciences?
- Are there new intersections between sub-disciplines concerning emotions, and is there need for a new sub-discipline?
- Do all HCI sub-disciplines have the same interest in emotions/who can benefit most from considering emotions?
- Which value might affective applications, affective systems, and affective interaction have?
- Which impact will emotion awareness have on HCI in general and the sub- disciplines in particular?

The workshop wants to draw together scientists and practitioners from a variety of disciplines, usability, task analysis, interface design experts, operating systems specialists, software architects, communication and network experts, sensor developers, and others. We want to discuss about the named topics in as wide an application spectrum as possible, such as internet applications, office work, programming, call centres, control rooms, mobile computing, mobile phones, virtual reality, presence, or home applications.

It is expected that at the end of the workshop a deeper understanding of the impact of emotion in the wide field of human-computer interaction will have been developed, chances and challenges will have been identified, possible consequences for the HCI community will have been discussed, and first steps to building the theoretical foundations for serious HCI-related emotion research will have been defined. As direct output of the workshop it is intended to publish a special issue of a journal on this topic.

2. WORKSHOP PROCEDURE

We will solicit submission of short papers related to the subject, which would ideally include brief high-level reviews of any domain literature that participants find relevant. As a way of bringing the domain to life, presentations of concepts or products that participants have been involved in are highly encouraged. The call for papers will be submitted to relevant newsgroups and mailing lists, within relevant European Networks of Excellence, and published on the workshop's website. Papers will be reviewed by the workshop's committee members.

The one-day workshop will be divided into 6 parts allowing the participants to introduce themselves and their field of work, present their ideas on the workshop's topic, discuss, and work collaboratively on selected issues. The topics discussed will arise from the interests and concerns of the participants who will be asked to communicate their thoughts and expectations prior to the workshop.

The workshop will include:

Keynote: A member of the community addresses the group. This will cover the reasons the workshop has converged and the importance of developing some actionable outcomes that can be disseminated to the field.

Introduction: Depending on the number of participants, there will be the opportunity to introduce oneself to the group.

Presentations, demos: A series of presentations from paper authors will follow, each not longer than 10 minutes. Demonstrations will be given in an extra block between the presentations (about 20 - 40 minutes, depending on number and extent of the demos).

Discussion: A discussion of issues raised in the presentations will be held. Based on the thoughts and expectations canvassed before the workshop and on questions raised during the presentations and demo session, the discussion will be led with the goal of identifying key points to be worked on and subjects for further discussions.

Thematic working groups on selected topics: Groups will form to work on some of the topics identified in the discussion. At this stage, the working groups will be relatively exploratory.

Create outputs: By debating the findings of the working groups, we will aim to develop tangible deliverables that are consensually agreed. These might be:

- A taxonomy and breakdown of the discipline itself
- A research framework for emotions in HCI
- A design process that will result in emotion being harnessed in HCI design
- An exhaustive set of research directions
- Defining next steps (e.g. another workshop/dedicated conference, issuing a special issue of a journal)

3. WORKSHOP COMMITTEE

Christian Peter, Fraunhofer IGD Rostock, Germany

Gerred Blyth, Amberlight Partners Ltd, London, UK

Prof. Bodo Urban, Rostock University, Rostock, Germany

Prof. John Waterworth, Umeå University, Sweden

Lesley Axelrod, Brunel University, London, UK

Steffen Mader, Fraunhofer IGD Rostock, Germany

Nicola Millard, British Telecom plc., Ipswich, UK

REFERENCES

- [1] Cockton, G. (2004). Doing to Be: Multiple Routes to Affective Interaction. *Interacting with Computers* 16.
- [2] *Interacting with Computers*, Volume 14, Issue 2, Pages 89-169 (February 2002)
- [3] *Interacting with Computers*, Volume 16, Issue 4, Pages 683-849 (August 2004)
- [4] Jordan, P. (2002). *Designing Pleasurable Products: An Introduction to the New Human Factors*. CRC Press.
- [5] Norman, D (2004). *Emotional Design: Why We Love (Or Hate) Everyday Things*, Basic Books.
- [6] Picard, R.W. (1997). *Affective Computing*. M.I.T. Press, Cambridge, MA.

The workshop's website is: <http://www.emotion-in-hci.net>