

Engaging with Emotions - The Role of Emotion in HCI

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Emotions are of increasing interest to the HCI community and there is an enthusiastic spirit of adventure amongst researchers exploring this area. Much technical research has been done focussing on development of various proof-of-possibility studies and prototypical emotion components, but work done to date has been fragmented and lacks coherence. The goal of this workshop is to share information among researchers and practitioners working in this field through organized discussion and thematic working groups. This workshop will continue bringing people together, forming a community, supporting networking and collaboration to advocate coordinated work in this fascinating field of research.

Keywords: Emotion, HCI, Affective Computing, Emotion Detection, Affective Applications

1. INTRODUCTION

The topic of emotion in Human-Computer Interaction is of increasing interest to the HCI community. Since Rosalind Picard's fundamental publications on affective computing [1-4], research in this field has gained significant momentum. More and more HCI researchers and application designers are beginning to recognize the importance of emotion in everyday interactions with people and computers alike. Several applications already try to appreciate their users' emotions. Be it by allowing the users to choose a pleasing look for their applications [5], designing Web pages targeted at specific user groups [6], or providing different ways to give feedback or offer help [7], emotions are finally recognised as a key attribute of users which must not be neglected.

Emotion research is largely grounded in psychology yet spans across numerous other disciplines. The challenge of such an interdisciplinary research area is developing a common vocabulary and research framework that a fast developing discipline requires. Emotion related activities in HCI are so far confined to two main areas: testing whether it is possible to "measure" emotion, and if and how emotions could be included in existing applications or artefacts. What is increasingly needed for advanced and serious work in this field is to place it on a rigorous footing, including developing theoretical fundamentals of HCI-related emotion research, understanding emotions' function in HCI, ethical and legal issues, and the practical implications and consequences for the HCI community.

The first workshop on emotion in HCI held in Edinburgh last year [8] brought an interdisciplinary group of practitioners and researchers together for a lively exchange of ideas, discussion of common problems, and identification of domains to explore. The workshop participants identified four key themes to address for continued growth in this domain. The identified themes are:

- theoretical fundamentals such as emotion models, emotion representation, and use of results from psychology;
- emotion detection affairs such as sensing technologies, data analysis, challenges and special requirements of HCI;
- affective applications, particularly why, what, and how to implement them, challenges and demands; and
- ethical and legal issues.

3. WORKSHOP TOPICS

The aim of this year's workshop is to bring together and support the growing community in the field of emotion-related HCI research. The emphasis will be on discussion and joint work on selected topics. Participants will engage in developing further the themes from the first workshop in as wide an application spectrum as possible, such as internet applications, ambient intelligence, office work, control rooms, mobile computing, virtual reality, presence, or home applications.

Topics addressed by the workshop are:

- How do applications currently make use of emotions?
- What makes applications that support affective interactions successful?
- How do we know if affective interactions are successful, and how can we measure this success?
- What value might affective applications, affective systems, and affective interaction have?
- What technology is currently available for sensing affective states?
- How reliable is sensing technology?
- Are there reliable and replicable processes to include emotion in HCI design projects?
- What opportunities and risks are there in designing affective 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.

4. WORKSHOP PROCEDURE

The anticipated outline for the one day workshop is as follows:

Introduction: Each participant will give a short introduction to his/her background and position paper

Demos: A slot for demonstrations of working prototypes of affective applications, sensors, data analysis tools and other related work.

Discussion: A discussion of issues raised in the introductory part will be held. Based on the thoughts and expectations canvassed before the workshop and on questions raised during the introduction, the discussion will be led with the goal of identifying themes and goals for the subsequent working groups.

Thematic working groups: Groups will form to work on the topics identified in the discussion. It is planned to work on exemplary case studies to streamline the discussions.

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

- Joint publications
- Collaborations
- Networking activities such as setting up online discussion groups/ mailing lists, web site, BSCW
- Grant proposals

Defining next steps: At the end of the workshop, the participants will agree on consequent common activities, such as papers to write, projects to develop, the next workshop, or proposing a special issue of a journal.

5. WHO SHOULD ATTEND?

This workshop is intended for both academics and practitioners. Interested participants should submit an extended abstract (about 800 words). Accepted contributions will have the chance to be extended to short papers (4 pages). Case study papers describing current applications or prototypes are strongly encouraged. As a way of bringing the domain to life, presentations of products or prototypes that participants have been involved in are highly encouraged as well. Papers will be reviewed by the workshop's committee members. Workshop updates and accepted papers will be made available on the workshop website.

For more information on the workshop, please see www.emotion-in-hci.net

6. WORKSHOP COMMITTEE

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REFERENCES

- [1] Picard, R.W. (1997). *Affective Computing*. M.I.T. Press, Cambridge, MA.
- [2] Picard, R. W, Healey, J. (1997). *Affective Wearables*, *Personal Technologies* Vol 1, No. 4 , 231-240.
- [3] Picard, R.W.(1999). *Affective Computing for HCI*. Proc. of the 8th International Conference on Human-Computer Interaction: Ergonomics and User Interfaces-Volume I. Lawrence Erlbaum Associates, Inc.
- [4] Picard R.W., Vyzas E., Healey J. (2001). *Toward Machine Emotional Intelligence - Analysis of Affective Physiological State*. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol 23 No. 10.
- [5] Brinkman W.-P., Fine N. (2005). *Personalising emotional skin designs*. Workshop on The Role of Emotion in Human-Computer Interaction, held at the HCI 2005 Conference, Edinburgh, September 2005. <http://www.emotion-in-hci.net/workshopHCI2005/positionpapers2005.html>
- [6] Lindgaard, G., Fernandes G., Dudek C., Brown J. (2006). *Attention web designers: You have 50 milliseconds to make a good first impression!* *Behaviour & Information Technology*, Volume 25, Number 2.
- [7] Heylen D. , Vissers M. , op den Akker R., Nijholt A. (2004). *Affective Feedback in a Tutoring System for Procedural Tasks*. *Proceedings of the Tutorial and Research Workshop on Affective Dialogue Systems*, *Lecture Notes in Computer Science* 3068, Springer-Verlag Berlin, Heidelberg, New York (2004).
- [8] Peter, C., Blyth, G. (2005). *The Role of Emotion in Human-Computer Interaction*, Workshop at HCI 2005, Edinburgh, UK, 6 September 2005, Volume 2, Pages 295-298, <http://www.emotion-in-hci.net>.