

Future Interfaces: Social and Emotional

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Panelists

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ABSTRACT

This panel addresses “science fact” for future social-emotional interfaces. We discuss new theory and upcoming interface technologies that enable or augment social-emotional interaction between people and computers, and between people via new forms of computers. The theme is rooted in: (1) findings that human-computer interaction is social and emotional even when interfaces are not designed with such interaction as a goal, and (2) advances in technology, enabling computers to recognize, express, and respond to emotional and social information. The panelists will describe the guiding theory for this research, show examples of emerging technologies including new wearable, implantable, and robotic interfaces, and discuss the implications of social-emotional interaction for interface development, design, and testing.

Keywords: Media Equation, Social Interfaces, Affective Computing, Wearable Computing, Sociable Robots, Implantables

INTERACTION AS SOCIAL-EMOTIONAL

Traditionally, interface designers have viewed their work primarily as the development of tools to facilitate the performance of information tasks. Similarly, users have believed that they respond to interactive interfaces as they would to mere machines, setting aside any social or emotional concerns.

However, over 70 experimental studies in the past ten years have shown that people do not respond to interactive software as a mere tool. Instead, individuals bring to bear a wide range of social rules and learned behaviors that guide their interactions with, and attitudes toward, interactive systems. Similarly, interfaces both induce a wide range of

emotions in users and are assigned a wide range of emotions by users. Social and emotional responses occur when users know that they should not and believe that they do not exhibit these responses. They occur when designers do not attempt to elicit these responses, and when the interfaces are as simple as plain text on a screen, with no reference to any social or emotional aspects (e.g., no use of the word “I”) [1]. Furthermore, users exhibit social-emotional responses without explicit training, and regardless of their level of computer experience.

What if this was not a trivial or accidental phenomenon? What if the social and emotional reactions that users have are important keys to building more useful, successful, and productive systems? In short, what if we could firmly ground the creation of human-computer interfaces in the rich and complex emotional lives of people? What kinds of systems might we build, and how would principles of design change? What technological advances are needed to accomplish bi-directional social-emotional communication between people and machines, and how close are we to obtaining these advances?

This panel brings together scientists who have contributed to theory elucidating how interaction is social-emotional (Nass), and to new technologies that can sense, understand, and respond to social-emotional cues (Picard, Warwick, and Breazeal).

We begin with two premises: First, systems that ignore the emotional components of human life are inevitably incomplete and inferior. Second, a system capable of proper, useful social and emotional interaction is not science fiction, but is science fact.

Our goal is to bring the state of the art to CHI, where the ideas can be exposed to a wide and talented group. We believe that traditional CHI disciplines are necessary to properly develop these systems, and that consideration of social and emotional factors will enormously enrich both

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the conventional interfaces we are all familiar with and new systems we have not even yet considered.

PANELISTS VIEWPOINTS

The four panelists address this topic from different fields and perspectives.

Clifford Nass and his lab have conducted over 50 studies on the social psychology of interfaces, and he is widely regarded as one of the foremost developers of theory in this area. He will introduce experimental findings illuminating the theory of social-emotional interaction with computer interfaces, supporting the claims above. Nass believes that as designers build interfaces that are more human-like, that we will see changes in degree rather than kind of social response; anthropomorphic interfaces will not lead to a discontinuity in user responses. However, more human-like interfaces will “up the social ante,” requiring interface designers to be more thoughtful and careful about obedience to social and emotional rules.

Rosalind Picard does not believe that interfaces necessarily need to become more human-like; instead she argues that they should be designed with explicit regard for human emotion. One way to study and minimize user frustration is to give the system the ability to sense and infer users’ frustration and to respond with skills of emotional intelligence when the computer has caused a problem. Her lab has created new technologies that enable computers to sense, understand, and respond to human signs of confusion, frustration, anger, interest, and joy, among other emotions. This includes tools directly manipulated by the user, and tools that passively sense muscle tension, facial expression, posture, and other skin-surface signals. Her lab has pioneered the development of wearable computers that recognize and respond to physiological indications of emotional state. She points out that emotional responses can be seen as information given out directly and “for free” by the user, and that systems could use these signals to improve service to the user [2].

Kevin Warwick and his team have advanced the possibilities for emotional sensing and social communication to a deeper level — literally — by designing and building implants that sense personal information and communicate it to others [3]. The signals range from those concerned with movement and senses, to those related with pain and the physical emotions such as anger, shock and excitement. Warwick, who is expected, along with his wife, to have communicating implants at the time of the panel, will describe this new technology along with several of its emerging possibilities for social-emotional interaction.

Cynthia Breazeal, designer and developer of the captivating Kismet robot, will present an interface capable of taking on a human-like or creature-like physical form. Her creation highlights the importance of expressing and responding to social and emotional cues in human-robot interaction. Kismet deliberately elicits and recognizes human social-

emotional responses, primarily for the sake of acquiring better feedback as it tries to learn [4]. By sensing the expressions of a human companion, the robot can discern if the human approves (shows positive expressions) or disapproves (shows negative expressions) of its performance. This technology illustrates the potential for interfaces to adapt for better pleasing people, without requiring any special skills on the part of the user.

CONCLUSION

The nature of the topic — social-emotional interaction — is such that all humans have some expertise in it, as we all have experience with human-human interaction. However, the difficulty in carrying this expertise into human-computer interaction is profound. Technology has traditionally not been competent at recognizing or responding to human emotional communication, and many designers and users are reluctant to embrace a viewpoint that would take technology in a more human-like direction. However, the technology is changing, and the theory that human-computer interaction is social and emotional is compelling more designers to consider new viewpoints.

The aim of this panel is not to convince everyone to agree on a particular conclusion. The issues are complex and the panelists have varying opinions about the implications of social-emotional interaction. The panelists’ creations include interfaces that are directly manipulated, interfaces that are worn on or integrated within the human body, and interfaces that assume a human or creature-like bodily form (robot). In all cases, the technologies exist and facilitate new ways of conducting social-emotional communication.

In this panel, we come together with the CHI community to present theoretical and technological advances, and to invite dialog regarding these advances. While our vision is long-term, embracing a future where some people arguably see the boundary blurring between humans and machines, our approach is grounded in present-day reality, rooted in emerging technologies that are fact and not fiction, and in scientific studies with real people. With this combination we hope to enable the community to be well prepared for designing interfaces that fully embrace and honor the inherent abilities of all users.

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