Empathy in the Internet of Things

Paul Coulton
ImaginationLancaster
Lancaster Institute for the Contemporary Arts LICA Building
Lancaster University, Bailrigg, Lancaster, LA1 4YW, UK
p.coulton@lancaster.ac.uk

Empathy is often expressed as our ability to 'stand in someone else's shoes' and is now viewed as an important component of what it means to be human. As an ever-increasing amount of our communications is online there is often less opportunity for conveying or feeling emotions such as empathy within current mechanisms. Whilst I would argue that empathy should be a concern for the design of all online systems, the Internet of Things offers a unique opportunity to explore the transmission and receiving of empathy, particularly if encompassed in aesthetically rich objects that use light, sound and haptics rather than text.

Design, Empathy, Affordances, Internet of Things.

1. INTRODUCTION

Although the word empathy only came in to existence in 1908 as a translation of the German word "Einfühlungsvermögen", and there are various ways in which empathy has come to be defined, it has arguably been captured most succinctly by George Orwell in his memoir, Down and Out in Paris and London, published in 1933.

> if you see somebody begging under a bridge you might feel sorry for them or toss them a coin, but that's not empathy, it's sympathy or pity. Empathy is when you have a conversation with them, try to understand how they feel about life, what it's like sleeping outside on a cold winter's night – try to make a real human connection and see their individuality.

Since that time it has been the subject of much research and theory and is often considered from two main perspectives; one is cognitive, whereby the drive is for a person to understand and identify with another person's mental state; the other, emotional empathy, is the drive to respond to another person's mental state with an appropriate emotional response [Shamay-Tsoory et al, 2009].

In recent times empathy has become politicised and promoted as a vital aspect that must be fostered within society, as Barak Obama illustrated in his commencement speech at Northwestern University in 2006;

> There's a lot of talk in this country about the federal deficit. But I think we should talk more about our empathy deficit - the ability to put ourselves in someone else's shoes; to see the world through those who are different from us - the child who's hungry, the laid-off steelworker, the immigrant woman cleaning your dorm room.

All of these considerations of empathy have been outside the technological arena and, with the increasing amount of our communication mediated through technology, often without any face-to-face interaction, suggests this consideration has been neglected. However, within science fiction, which in this context I am considering as providing a Design Fiction [Bleeker 2009], the importance of empathy in relation to what it means to be human in a technological landscape, is a prevalent theme. The most notable example comes from the 1982 film, Blade Runner, which is an adaptation of Phillip K Dick's novel, Do Androids Dream of Electric Sheep [Dick, 1968] which presents a vision of the future

with flying cars and sophisticated artificial humans known as replicants (androids in the original novel). Whilst the technology presents a compelling vision of a possible future in a highly technological age, it poses the more fundamental question of what its means to be human in such a society. This is explored through one of the central elements of the film, a test known as Voight-Kampff, that measures bodily functions such as respiration, blush response, heart rate and eye movement in response to emotionally provocative questions [Sammon, 1996]. Replicants are unable to communicate the feeling of empathy for which these responses are indicative and, thus, are easily distinguished from humans by the Blade Runners. While a work of fiction, I would argue that this idea reflects the present day failure of digital devices and online communications to facilitate the expression of empathy between people.

Whilst no consensus yet exists on how to realise the so-called Internet of Things (IoT), the vision of a global infrastructure of networked physical objects [Korteum et al 2010] the concept is compelling and offers the possibility of creating connected objects that can convey emotions remotely. I believe current systems suggest emotion is something that cannot easily be conveyed with text, however, visual, audio, and haptics may offer an alternative, utilising concepts such as *aesthetic emotions*. Aesthetic emotions refer to emotions that are felt during aesthetic activity and/or appreciation. These emotions may be of the everyday variety (such as fear or sympathy) or may be specific to aesthetic contexts such as perceptions relating to the sublime or the beautiful [Xenakis et al 2012]. While the emotion usually constitutes only a part of the overall aesthetic experience it may play a more or less definitive role for the viewer. This suggests that the aesthetics of IoT objects could be used as a means of conveying empathy and should have equal status with function.

The other area that could provide valuable insights for conveying empathy is affective computing which seeks to expand human computer interaction by including emotional communication. Work in this area can be considered around four main areas [Picard 1999]:

- reducing user frustration;
- enabling comfortable communication of users emotion;
- developing infrastructure to handle affective information and;
- creating tools to aid development of social skills.

Whilst the second of these areas seems the most relevant there are also issues raised within three and four that could also aid with conveying empathy within the IoT.

The research around affective wearable's [Picard 1997] could be considered as providing possible examples of emotional IoT, although they have largely focussed on the technology as a means of gathering physiological data. However, there are some research projects that do provide what might be considered as early examples in this area such as the connected pillow [Gemperle et al, 2003] which augments a soft, huggable pillow with sensing and wireless phone technology to provide a physical touch, and thus better social and emotional support for distant family. To send a hug the user squeezes the device and speaks the users name into the internal microphone. The corresponding pillow lights up and vibrates, indicating that a 'hug' has been sent, from a trusted contact. A similar idea is explored with the Huggable Pajamas [Teh et al 2008] that were designed to let parents remotely hug their children while they are away.

In relation to IoT, the Karotz[1] wifi interactive Smart Rabbit, formerly known as Nabaztag, allows messages to be sent remotely between family members, friends

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[1] www.Karotz.com

or remote groups [Lund et al 2009]. Aimed at communicating via the colour of lights and moveable ears, to express basic emotions these devices come with an open-application-programming-interface (API) and offer the chance for diverse use. Such devices provide early insights into digital empathetic communication.

2. DESIGNING FOR EMPATHY

Empathy has emerged as a core tenant of design and is representative of the shift from placing the 'designer' as the central character or expert within a particular design activity to one which places the emphasis on gaining the perspective of the user (human) of a given product. While some design methods achieve this through participation of users within an iterative design process, or effectively turning the user into a co-designer, other more general activities employ techniques whereby the designer actively gains empathy from a particular user before undertaking the actual design; this is seeking to design 'with' empathy. However, designing systems with empathy for users may not necessarily produce systems that produce empathy between users. In terms of designing systems that are specifically aimed at encouraging empathy between users, there is very little work within the current design literature. The most notable examples appear in relation to computer games. In particular, the work on conflict resolution games [Belman and Flannagan, 2009] suggests a number of principles for game designers to adopt that can foster feelings of empathy between players. Whilst some of these principles are specific to games design, I believe that others have the potential to be applied more generally and produce approaches around designing 'for' and not just 'with' empathy.

2. AFFORDANCE OF EMPATHY

Another aspect of designing IoT objects for conveying emotion is their form and many of the desired features for Tangible User Interface (TUI) design may prove relevant in this regard, such as Ishi [2008]:

- The form of objects should encourage and support spatial manipulation.
- Object affordances should match the physical constraints of the object to the requirements of the task

It is worth considering the concept of affordance in more detail, as the potential affordances IoT objects may offers will differ from what can be achieved with virtual components. The original concept of affordance was conceived by Gibson [1977] to define the actionable properties between the world and a person and was most notably extended by Norman [1999] who divided affordance between real and perceived affordance. In particular, he used this as a means of distinguishing between the properties of an object that are controllable by a designer. In the case of real objects, both the real and perceived affordances are controllable, whereas for screen-based interaction, generally only the perceived affordances are under the control of the designer as the computer system comes with built-in physical affordances [Norman, 2002]. As IoT enables the creation of physical objects this means designers must take into account both the real and perceived affordance of the object itself in relation to conveying emotion and will require new understandings to be developed.

3. CONCLUSIONS

Overall, I believe the blurring of the physical and the digital in IoT presents unique opportunities for addressing the complex problem of how we can convey complex emotions, such as empathy, online. In particular, I have considered the need for design approaches that not only have empathy for the end users, but they

allow the empathy of the end users to be expressed. In particular, I have suggested that both form and function should be given equal value and that designers may consider drawing upon the concepts of aesthetic emotions in this regard. This then brings in the challenge of understanding the affordances that would need to be developed and understood when conveying emotions.

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