Fragments of Companionship – Design Insights From a Blog Study

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Abstract
With this position paper I would like to explore the idea of how we interact with and experience robots – and in particular an exploration of what this would imply for more sustainable robotic companionships. From my recent research activities I will reason around particular qualitative findings from a preliminary study based on a Pleo blogging community and discuss about design challenges for Human Robot Interaction (HRI).

Keywords
Human Robot Interaction, Robotics, Empirical Studies, Implications for Design

ACM Classification Keywords
I.2.9 [**Artificial Intelligence**]: Robotics – Commercial robots and applications; H.1.2 [**Models and Principles**]: User/Machine Systems - Human Factors

Introduction
Designing robots, virtual creatures, artificial companions and social artifacts can really be rather challenging sometimes. Forms and shapes that people are familiar with seems to inevitably correlate with their interpretation and interaction. For instance - Paro's inventor, Takanori Shibata, proposed an idea that people's acceptance towards the therapeutic robot seal would be higher than compared to e.g. a robotic cat, as people has less prior experiences with seals than with cats.

Similarly Ugobe, the company behind the robot dinosaur Pleo plays along a similar line where fewer people know beforehand how a baby dinosaur would manifest itself in the world. In an ongoing study we are investigating different practices that people are reporting on regarding their interaction and relationship with robotic products. Here I will present some insights from a preliminary study on a Pleo blogging community.

Background
Within the european LIREC project (LIving with Robots and interactivE Companions)[1] we are primarily conducting ethnographic studies on how people are

[1] www.lirec.org

living with robotic artifacts, seen from a companion and sustainable interaction perspective [5]. As a preliminary and exploratory study in this area I started to look at blogging culture as a way of learning about how people could report on their relationship with robotic pets. In particular I got very interested in blogs and other media concerning Pleo.

The practice of blogging [8] and related ethnographic methods for data gathering and analysis [3] is an interesting chapter on its own, but perhaps the most interesting are the revealing details that they can capture. The following preliminary insights are based on the publicly available blogs on *PleoWorld*[2].

By drawing from emergent concepts in HCI [1] and mobile HCI [2], I would also like to explore how a phenomenological approach could make us reflect differently upon design in robotics and HRI. Here I will start to exemplify with post and excerpts containing intelligence about eyes and vision from physical, social and cultural perspectives.

Fragments of Companionship

In our first blog-post example Pleo encounters a mirror and the user reports upon the observation:

Frankie's first good look at himself was hysterical... He growled at himself, he sang to himself, he smiled at himself. What a ham!

This is one of a few examples we found when the users expectation of Pleo's visual capabilities suddenly (and likely accidentally) becomes grounded in the context. In another post we for instance realized how design can be used to support social and cultural constructions without being at all explicit:

I'm also uncomfortable really giving it a sex or normal designation of him/her. It's a bit like baby chickens where it's a real skill to tell if it is a boy or girl. How do you tell? So it's it for now. Perhaps I'll have to set up an indirect test. Does it prefer pink or blue? I'll wait a little while when it is a bit more mature.

In this case the suggested test is also visually orientated in that Pleo would recognize pink and blue and also understand its cultural meaning. Among practices that appears more common but at the same time surprisingly diverse are clothing, accessorizing and personalization:

Today, I am beading a crystal necklace for WiiGoBe, and adding a fossil charm! His crocheted wardrobe will consist of a "floppy hat", walking boots, cape and of course, sunglasses, for our walks and sidewalk surf days! He will be styling!

The physical appearance will afford other artifacts to be equipped like the sunglasses in this example. Other exemplifications also points toward the embodiment itself as a resource for a kind of emotional investment:

We have made the decision to return him for a new one. His eyelid began to flake off and small holes appeared on his neck. We are really going to miss him. He is a quiet, shy and very affectionate Pleo. He loved to do tricks for us and sing Christmas songs. Our best memory of Roger will be how he would come up and ask to cuddle with us. We will always have the memory

[2] www.pleoworld.com

of his cute little snore in our ears. We love you Roger Greenleaf.

The physical degeneration of this robot (e.g. the eyelids) in this case becomes puzzling and collapses the experience down to the consumer electronics product it was sold as. These and many other blog-posts all seems to embed a rich and diverse resource for informing and leveling companionship design. In this workshop I would like to explore different research challenges and counter measures for balancing expectations. I will here conclude with an attempt of approaching this problem.

Discussion

Using or trying to conform to natures designs is often a good idea, since those designs have evolved under conditions posed by nature itself. On the other hand it comes with the price of high expectations if those designs are common in peoples everyday life. For instance – placing eyes on a robot comes with a multitude of expectations. On the biological, physical and highly tangible level an eye is supposed to behave in certain ways, it should become irritated and provoke reflexive reactions if touched and fluids should keep it's surface wet between enclosing eyelids. On the social level it should convey a rich interaction with both autonomous and expressive blinks, gaze, following, staring, focusing and tears. On the cultural level eyes has a deep meaning and would be regarded as mirrors of the soul, an agents visual window to the world, a deeply sophisticated organ that is considered fragile, have rich emotional values and central to how we humans relates to anything visual. From within the cultural sphere we also have highly raised expectations from envisioned interaction with robots, e.g. from science fiction. Designing for these amounts of expectations then arguably becomes a really hard challenge – especially if we merely forward designs by following tradition.

One thing we can hope for on the other hand is that an "artificial" eye can be negotiated and accepted to have but a subset of these expectations and then incrementally advance from that. The more direct way would be designing for something that would level expectations, for instance emphasize on *technomorphic* visual capabilities or use more marginal and unfamiliar sources of inspiration e.g. camera-lenses and *compound eye's* respectively (Fig. 2).

figure 2. Design inspirations for more balanced expectations.

Similarly we can reason this way about any other organ (or component), e.g. ears, nose, skin, mouth, heart, brain, etc. Additionally also considering underlying familiar shapes e.g. head-shape would cause increasing expectations and provoke reactions – even emotionally.

The emergent effect of a composite design is the resulting embodiment – the integration of physical, social and cultural bodies. The expectations of such embodiment e.g. a dog then arguably follows the same reasoning, but from the outside in – cultural, social and physical. Even the smallest part would be inseparable

from the bodies it innate. This compositional effect would also get higher for more commonly occurring embodied interactions e.g. humans. This is indeed very related to the discussions about Mori's uncanny valley and human likeness [7]. Just when all bodies conforms and starts to become believably close to a real person, more or less subtle disturbances in these causes a repelling and hesitant reaction in humans. Even the abundance of social or cultural grounding would have a kind of uncanny effect – similar to a impaired being or a human that never went to school, or worked in the garden, been in love or experienced the loss of someone close.

Possible ways of approaching such challenges are to explore design principles that can e.g. avoid, exaggerate or tangent the very components causing them. Reconnecting to the blog-excerpts earlier, the active exploration of something "new" like Pleo, collides with the things that are indeed familiar – in every embodied aspect. The ongoing re-negotiation and construction of the phenomenological embodiment becomes a way to test designs.

It is important to stress that familiarity – similarly to how is exploited in HCI - apparently can be considered a sort of meta-material and thus something that can be used in robotic design. Finally, two inspiring examples of robotic companion designs from research that I believe have managed to balance expectations along this line of reasoning are *Tabby* and *The Hug* (For a brief overview see e.g. [4]).

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