‘Give me poetical science’: an invited speaker abstract for Steve North - RM4ACI (Research Methods in ACI) workshop @ ACI2016 - 15 November 2016

Steve North
The Mixed Reality Laboratory,
University of Nottingham
UK
Steve.North@nottingham.ac.uk

ABSTRACT
My big themes in this paper are: (i) ‘poetical science’: amalgamating quantitative and qualitative methods into a new hybrid approach for ACI and (ii) identifying ‘honest’ routes to user-centred design for ‘unaware’ interactors (be they neurodiverse humans or nonhuman animals).

Author Keywords
animal-computer interaction;horse-computer interaction; ethology;methodology;ethnography; unaware interactors;

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; H.5.2. Information interfaces and presentation (e.g., HCI): User Interfaces - Evaluation/methodology; Theory and methods; User-centered design;

INTRODUCTION

*“Invert the order! Will you give me poetical philosophy, poetical science?”*Ada Lovelace c1845 [10].

When Ada wrote these words, she was describing the eternal challenge of trying to balance up all that is good and worthy about both qualitative and quantitative methodologies.

When considering research approaches for ACI, I would like to suggest that we might benefit from considering such a hybrid methodology to be our ‘gold standard’.

MY ACI EXPERIENCE AND RESEARCH

I am one of the academic partners for the HABIT (Horse Automated Behaviour Identification Tool) project [5]. The outputs from this work are intended to provide automated analysis and recognition of horse-to-horse and horse-to-human behaviors, as observed in unconstrained / ad-hoc video. This has many applications within equine welfare and education, but HABIT also relates to the development of ACI prototype systems. When a new system is trialed with horses, HABIT would be able to analyze video recordings of interactions and behaviors, during an evaluation period. This would help the designers to understand if the horses’ responses are within the natural repertoire of equine behaviors.

In 2016, I have also taken the lead on a project (Parelli vs. ISES) evaluating less orthodox horse training programs, against evidence-based ‘good practice’ in equitation science [6].

There are methodological commonalities between HABIT and Parelli vs. ISES, in that both extend quantitative ethology-based approaches into the analysis of human-animal interactions. In the case of HABIT, this relates to human-horse interactions and whether these are ‘natural’ to the horse. With Parelli vs. ISES, training behaviours involving the horse / human dyad are logged and analysed.

Also during 2016, I was co-editor with Clara Mancini of ACM Interactions’ Special Section on ‘Frameworks for ACI: animals as stakeholders in the design process’ [7] and published my own thoughts on horse-computer interaction [3].

METHODS THAT I HAVE APPLIED IN MY OWN RESEARCH

Much of my work to date has focused on investigating a hybrid between the qualitative methods prevalent in HCI (ethnography, conversation analysis, semi-structured questionnaires) and ethology-based approaches from the animal sciences.

I see this as a two-way process and I am interested in seeing more ethology in HCI and more ethnography /humanities-based (critical) animal studies / anthrozoology influencing the animal studies domain.

My ethology-based approaches have tended to involve ethograms and behaviour frequency counts, using logging software. I have then applied fairly conventional statistical analysis to the resulting datasets. In my Parelli vs. ISES project, I repeated frequency observations to check for both inter and intra rater reliability.

More recently (partially influenced by Lawson et al.'s article on speculative design for the dog internet [1]), I have been thinking and writing about 'design fictions' [9] in horse-computer interaction. I am employing fiction as a 'thought experiment', intended to help system designers understand the 'otherness' of non-human animals. So, in a sense, I am using very qualitative, humanities approach in order to make the case for objective, quantitative tools, such as HABIT.

My proposal being: 1. introduce ACI designers to fictional speculations about the requirements of another species (their unfamiliar priorities, distinction from human priorities etc.), 2. Designers will recognise that imposing their anthropocentric criteria is unacceptable, 3. Designers will search for objective methods to both: determine the real needs of non-human animals and to evaluate prototypes introduced to them.

DISCIPLINES THAT I HAVE COLLABORATED WITH

Anatomy, equitation science, animal behaviour / ethology, veterinary science, computer vision and machine learning.

MY PERSONAL STAND ON (SOME OR ALL OF) THE WORKSHOP QUESTIONS A-D

A. What is the toolbox of research methods relevant for the ACI community? – currently, this toolbox is mainly drawn from HCI, with some more 'numbery' elements of psychology, behaviourism and animal science and statistics thrown in. There is no reason that our toolbox should be limited to these fields…
B. What research methods can we import, inherit or adopt from HCI, behavioural science, computer science, game studies and other fields? - I have already touched on this elsewhere in this document. I believe that ACI is already importing many of the ethno-methodological approaches, that it shares with anthropology. I would like to see more behavioural / animal sciences / ethnology approaches introduced.
C. What research methods specific for ACI still need to be developed? Beyond my proposed hybrid methodology (as discussed in this paper), I am keen that we have an ethical commitment to ***'build only what they want or need'***.
D. How can the multi-disciplinary field of ACI foster the exchange of ideas and promote collaborations between researchers coming from different backgrounds? - I would hope that workshops such as this one will help to encourage this process. Otherwise, I think that it has to be left to develop organically. I am not in favour of ACI shutting down any avenues at this early stage, or becoming too prescriptive. I hope that we can learn from HCI over this, where - these days - it can prove challenging to deviate from the prevailing orthodoxy (however alternative / progressive HCI's approaches were once thought to be!). As we find a need to collaborate with a new field, I hope that we may start to acquire the best elements of their methods, by 'osmosis'.

CONCLUSIONS: CHALLENGES THAT I WOULD LIKE TO SEE ADDRESSED BY THE ACI COMMUNITY

Is ACI part of HCI, or vice versa?

I would argue that HCI is a part of ACI but I am also aware that we may face an uphill battle to convince mainstream HCI practitioners that this is the case (!). However, in order for nonhuman animals to become design stakeholders and to actively challenge an anthropocentric world-view, it may be essential that we keep raising this point. ACI faces continued marginalisation and even dismissal, if it doesn't gently remind HCI that they are actually *our* subfield!

I present 'a taxonomy tree of computer interaction things' (see Figure 1) as a tongue-in-cheek representation of the relationship between ACI, HCI and all of the other 'CI's.

From this tree, it is possible to see that computers may interact with many different types of 'things'. At various points, the tree divides into branches for 'things with agency' vs. 'things without agency'. The latter describes the world of inanimate objects, exemplified by (but not limited to) wood and stone (although, I imagine that some humanities researchers might argue that an inanimate object may develop agency, based on the cultural significance that it acquires?). 'Things with agency' then branches into 'living things' vs. 'computers'. There might be other ways to describe this particular branching (carbon-based vs. silicon-based, organic vs. non-organic, replicating vs. non-replicating etc.). However, 'living things' has been chosen because traditional illustrations for the biological tree of life tend to use this as a starting point. The tree of life then forks into domains (not shown in the 'things tree') and then into kingdoms (shown: plant, animal, fungi etc.). One branch in my tree that may require explanation is labelled 'protista' (top left). This kingdom describes living things that are on the cusp of plant, animal and fungi. Another branch, at a higher level than non-human-computer interaction, might be insect-computer interaction. This may sound an unlikely area for research, but the book *Insect Media: An Archaeology of Animals and Technology* [8] might suggest otherwise (!).

This tree illustration is only intended to provide some notional context within which to consider the relationship between ACI and HCI. However, it does also provide a bridge to some of the more esoteric work on multispecies ethnography, 'otherness' and the humanities. In these areas, there is a great deal of interest in work that considers inanimate objects and their relationships with other aspects of human culture (including technology).

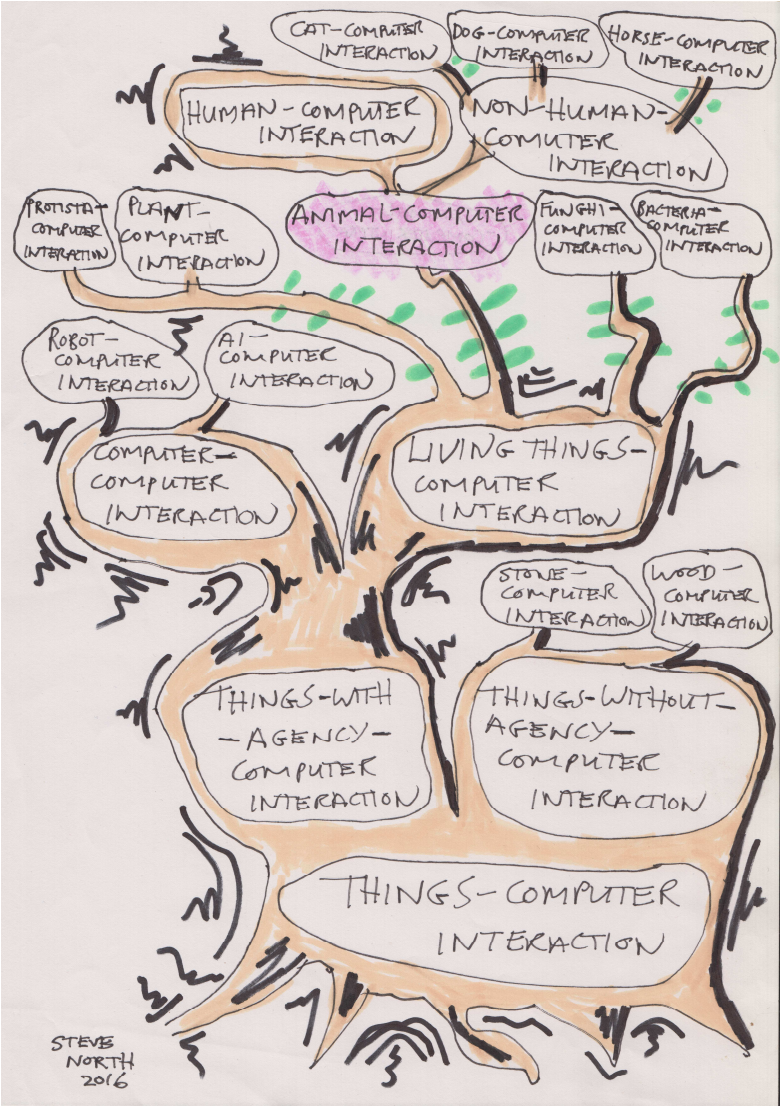

Figure 1. A taxonomy tree of computer interaction things

'Poetical science': a hybrid quantitative / qualitative methodology, combining elements of ethology and ethnography

In considering the bringing together of ethnography ('poetical') and ethology ('science') into a hybrid methodology for ACI, I previously labeled this as 'ethographology' [4]. Similar issues have been considered under the pairing of ethno-ethology and etho-ethnology [2]. These are defined as:

- ethno-ethology: "recontextualizes the approach to modes of knowledge within the interactivity of human/non-human relations in order to identify the representations and other cultural phenomena humans use to interact with animals and the practices concomitant with these representations. [2].
- etho-ethnology: "seeks to describe and understand how humans and animals live together in hybrid communities sharing meaning, interests and affects, articulated around jointly negotiated significations" [2].

The authors go on to suggest that these two ideas "need to be developed if we are to begin to gain a thorough understanding of the phenomenon and dynamics of human/animal communities" [2].

Whereas, ethno-ethology and etho-ethnology specifically describe human-nonhuman interaction, my proposed ethographology makes no distinction between humans and others. It is just a blending of techniques from ethology and ethnography, which may then be applied to the study of all things with agency.

How to avoid the unconscious projection of personal design priorities and enthusiasms onto 'voiceless' co-designers – THIS IS AN ETHICAL ISSUE!

We need to develop objective tools and methods to 'capture the requirements of' and to 'collect feedback from' our co-designers. Note: these might be complimented by the qualitative elements of the hybrid methodology that I am proposing. However, there is a need for evidence-based behaviour identification at certain key stages in the design process (requirements capture and evaluation), to avoid researcher self-deception ("of course my parrot wants to play VR golf!").

Co-designing methodologies for implicit and unaware interactors – both the human and nonhuman 'voiceless'

I refer the reader to my last answer!

Other discussions that I would like to see in ACI

1. ACI research and a commitment to animal rights / nonhuman personhood: is this an ethical requirement? Do we have a position? Would we (for example) provide a platform for a research on an automated abattoir?
2. What is the point of a quantitative methodology if the sample size is not statistically significant?
3. Can qualitative ACI methodologies ever claim to be evidence-based? How?

'Give me poetical science…'

REFERENCES

1. Shaun Lawson, Ben Kirman, and Conor Linehan, 2016. Power, participation, and the dog internet. *ACM Interactions 23*, 4, 37-41. http://dx.doi.org/10.1145/2942442. 1072-5520.
2. Dominique Lestel, Florence Brunois, and Florence Gaunet, 2006. Etho-ethnology and ethno-ethology. *Social science information 45*, 2, 155-177.
3. Steve North, 2016. Do androids dream of electric steeds? The Allure of Horse-Computer Interaction. *ACM Interactions 23*, 2 (March-April), 50-53. http://dx.doi.org/10.1145/2882529. 1072-5520.
4. Steve North, Carol Hall, and Amanda Roshier,[unpublished]. Multispecies ethographology: from ethnography to ethology via horses and video.
5. Steve North, Carol Hall, Amanda Roshier, and Clara Mancini, 2015. HABIT: Horse Automated Behaviour Identification Tool – A Position Paper. In *Proceedings of the proceedings of ACI@BHCI (Animal Computer Interaction Workshop), British HCI 2015* (Lincoln, UK, 13 July 2015 2015), BCS, UK. http://dx.doi.org/10.13140/RG.2.1.3395.0881.
6. Steve North, Ann Hemingway, Andrew McLean, Harriet Laurie, and Caroline Ellis-Hill, 2016. Evaluating a natural horsemanship program in relation to the ISES first principles of horse training. In *Proceedings of the 12th International Society for Equitation Science Conference (ISES2016)* (ifce - institut français du cheval et de l'équitation, Saumur, France, June 23-25 2016), International Society for Equitation Science. http://dx.doi.org/10.5281/zenodo.54733.
7. Steve North and Clara Mancini, 2016. Introduction: frameworks for ACI: animals as stakeholders in the design process. *ACM Interactions 23*, 4, 34-36. http://dx.doi.org/10.1145/2946043. 1072-5520.
8. Jussi Parikka, 2010. *Insect Media: An Archaeology of Animals and Technology*. University of Minnesota Press. 9780816667390.
9. Bruce Sterling, 2005. Shaping Things (Mediaworks Pamphlets).
10. Betty Alexandra Toole, 1998. Letter from Ada Lovelace to her mother, Lady Byron. Undated Fragment, [Before December 1845]. 234-235. In *Ada, the Enchantress of Numbers: Prophet of the Computer Age* Strawberry Press, Mill Valley CA, USA, 234-235. 0912647183.