Technology for Bonding in Human-Animal Interaction

Conference or Workshop Item

How to cite:

For guidance on citations see FAQs.

© [not recorded]

Version: Accepted Manuscript

Link(s) to article on publisher’s website:
http://dx.doi.org/doi:10.1145/3152130.3152153

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online’s data policy on reuse of materials please consult the policies page.

oro.open.ac.uk
Technology for Bonding in Human-Animal Interaction

Abstract
This workshop focuses on the use and influence of technology on human-animal bonding, and how to facilitate them with technology. We explore the elements and characteristics of human-animal bonding, and how technology is connected to emotions and bonding between the human and the animal. We are particularly interested in animal’s experiences, emotions, and welfare in bonding. The workshop facilitates discussion, creates a framework to support design activities, identifies future research themes, and creates ideas on facilitating the mutual bonding in human-animal interaction. The main focus is on dogs, but workshop aims is to pave way for further investigations and research with other domestic animals, such as cats, horses, and rabbits.

Author Keywords
Animal-Computer Interaction; Human-Animal Interaction; emotion; bonding; dog

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction
Creating technological solutions to facilitate human-animal bonding offers exciting opportunities to explore both for academics as well as companies creating products for the market. Indeed, there is an exploding
number of solutions on the market, for example, for
dogs, which seem to address the human-animal
interaction. There are also questions hanging in the air:
Are the solutions facilitating the human owner’s bond to
the animal calming the owner’s conscience while away,
or are they facilitating the mutual bond and positive
emotions of both the human and the animal? How do
the animals perceive and experience the solutions?
What kind of solutions can enhance the welfare of both
the human and the animal, facilitate and deepen the
bonding, and create positive emotions for both?

This workshop aims to address aspects of human-
animal bonding from experiences to technology design.
We aim to bring together academics and practitioners
to discuss and ideate opportunities for research and
design in this field. The main focus is on dogs, as this
relationship is currently most known about. The aim is
that the dog acts as an example species, paving way
for exploring other human-animal interactions and
bonding to be facilitated and expanded with technology.

Motivation
When creating new technological solutions to facilitate
and expand human-animal interaction and bonding, we
need to explore and understand what are the elements
and characteristics of human-animal bonding: what
cognitive, affective, and social aspects are involved.
How do humans and animals experience the solutions?
What new technology could be developed for bonding?

Problem formulation

Dogs share many of the socio-cognitive skills with
humans [22]. Attachment bond between pet dogs and
their owners resembles relationship with their own
species [15]. However, we lack a comprehensive
understanding of how dogs experience their life with
us. Human-animal interaction (HAI) has been shown to
have positive influence on human health and well-being
[19], [23]. For example, the affiliative interaction of
humans and dogs (e.g. owner petting the dog) lowers
cortisol levels and increase oxytocin and dopamine
levels in both species [14]; [5]; [12].

Generally, people agree that domestic animals, such as
dogs, experience emotions [11]. However, the
existence of emotions in dogs and perception of dog
emotions by the caretakers are separate issues [6].
Human attention is generally drawn to the facial
expressions of dogs, although emotions are visible in
dog’s whole body [17]. Humans recognize friendly
behavior/ happiness of a dog most easily, but other
extemptions such as aggression and fear are more difficult
to identify [21]. The emotional expressions of dogs
and their responses to human emotional signals could
have evolved during domestication and have adaptive
significance [10], [24], [20]. However, subtle changes
in dog’s behavior related to their affective states can be
difficult to notice. Nonverbal dogs cannot be requested
how they are feeling, for example, whether they have
pain.

Dogs are loved family members and companions [4].
Pet owners have strong interest in understanding their
pets’ emotions [7]. According to Mancini [9], Animal-
computer interaction (ACI) aims to, among other
things, “foster the relationship between humans and
animals by enabling communication and promoting
understanding between them; technology that allows
companion animals to play entertaining games with
their guardians or enables guardians to understand and
respond to the emotions of their companion animals
might be consistent with this aim”.

Three existing approaches for enhancing bonding

Increased understanding. The role of the technology
should be to support the human-animal interactions but
not to replace human interpretation and direct
observation [13]. Substituting human interpretation
may undermine or even harm human-animal
relationship [7]. In the future, technology could deepen the relationship by opening the dog’s world to the human, e.g., by visualizing the invisible scent-universe to the owner [2]. It is thus important to consider how technology may best serve in establishing and deepening the emotional and social bonding between the animal and the human.

Doing activities together. Using playful technology together [16] or even simply observing the animals use the technology [25] can enhance the emotional relationship between people and animals. Technology may also enable remote communication, e.g. via Skype, to support long distance social interactions [18]. Technology may help in the early bonding with new pets. For example, Alcaidinho et al. [1] gave a Whistle activity monitoring device for people who wanted to adopt a shelter dog. The participants of this study felt that the device helped in understanding the dog’s needs, encouraged them to spend more active time with the dog, and facilitated bonding with the dog.

Developing shared interaction techniques. Touch is important for both animals and humans. It has been proposed to have potential for technology mediated communication of relatedness and intimacy in human-animal relationship [3]. Lee et al. [8] experimented with wearable computing for remote human-poultry interaction. The human could stroke a chicken doll, with embedded touch sensors that transferred the movements to the real animal via a wearable haptic vest. Results from an experiment showed that people enjoyed being able to remotely touch the animals and the system seemed to be pleasurable for the pet, too. Cheklin et al. [3] extended the idea to dogs; they propose that working humans could remotely play with rescued dogs and nurture them via haptic vest. This kind of interaction could help both parties, by easing the stress of a worker as well as the rescued dog. Remote touching of animals would enable pet nurturing also for people with allergies [8].

How are these raised aspects and what other aspects are connected to designing technology aiming to facilitate and expand the human-dog, or more generally, human-animal, bonding?

Goals and activities
Goals of the workshop are:

- Bring together interested researchers and practitioners from different disciplines and backgrounds with interest in emotions, human-animal bonding and technology.
- Build a network of the participants to facilitate further collaboration and research activities.
- Create discussion from different disciplinary perspectives and practitioners’ viewpoint on human-animal bonding and its elements.
- Identify opportunities for research and design in the area of human-animal interaction and bonding.
- Create ideas for technological solutions supporting and expanding human-animal bonding, e.g. to enhance understanding, and sharing of emotions with the use of technology.

Activities prior to the workshop: Participant selection (max 15) based on an online questionnaire prior to workshop with background and contribution statement and view on HAI and bonding. Participants are selected based on diversity of backgrounds and contributions.

After the workshop we report results at workshop website, and aim for an academic publication.

Biographies of organizers
Heli Väätäjä is a postdoctoral researcher at the Research Group for Emotions, Sociality, and Computing (ESC), Faculty of Communication Sciences, at the University of Tampere. Her research interests in ACI include experience design and evaluation with animals, innovative use of technology for animal welfare,
human-animal relationship, training, and daily activities.

Päivi Majaranta is a researcher at the Research Group for Emotions, Sociality, and Computing (ESC), Faculty of Communication Sciences, at the University of Tampere. Her research interest include human-technology interaction, human-animal-technology interaction and multimodal interaction methods. She has special knowledge in gaze based interaction.

Heini Törnqvist is a researcher at University of Helsinki, Faculty of Veterinary Medicine, Finland. She is currently working in a project studying dog’s cognitive processes with eye-tracking and EEG methods, and in a project developing technical devices for monitoring dog’s well-being. Her research interests include developing animal friendly research methods for dog studies, and comparative cognition studies between humans and dogs.

Mari Ainasoja works as a researcher and project coordinator at the University of Tampere. Her work focuses at transmitting the voice of customers into business development. Her research interests cover customer experiences, from feelings and emotions in business to service development and digital customer journeys. Currently, she studies these topics in the project “Buddy and the Smiths 2.0” that develops technology related to dogs.

Veikko Surakka received the MA, Lic, and PhD degrees in psychology in 1990, 1993, and 1999, respectively from the University of Tampere. He is a Professor of interactive technology (2007-present) and the head of the Research Group for Emotions, Sociality, and Computing (http://www.cs.uta.fi/hci/esc/), Tampere Unit for Computer-Human Interaction, Faculty of Communication Sciences, University of Tampere. The research group focuses especially on research on emotion, cognition, human-human as well as human-technology interaction research.

Oskar Juhlin is a Professor at the Department of Computer and Systems Sciences at Stockholm University. His research interest include human animal interaction, social media and road traffic, video interaction and fashion. He is one of the leading founders of ACI research and community. He has studied, e.g., interaction between dogs and humans in urban environments as well as in the wild.

Clara Mancini is a Senior Lecturer at The Open University and the founding director of the Animal-Computer Interaction (ACI) Laboratory. Clara is especially interested in ACI’s methodological challenges, innovation opportunities and potential for contributing to human and wellbeing, social inclusion, interspecies cooperation and environmental restoration.

References