Exercise Pal Mootchi

Wai Shan (Florence) Ng and Ehud Sharlin

Interactions Laboratory, Department of Computer Science, University of Calgary
2500 University Drive N.W.
Calgary, Alberta, Canada, T2N 1N4
{wsng,ehud}@ucalgary.ca

Abstract. Exercise is vital to maintaining good health, but many people neglect to work out regularly or often enough. One reason is the lack of will to take part in physical activities. We believe that interactive technologies can play a role in providing entertaining and implicitly educational mechanisms that will help people pursue healthy physical activities. As an example to our approach we present a mixed reality pet, *Mootchi*, which will provide users with an emotional incentive for exercising, indirectly acting as a persuasive physical trainer. This short paper outlines our prototype implementation and initial findings based on a design critique of *Mootchi*.

Keywords: Personal projection, emotional attachment, mobile interfaces, persuasive educational interfaces.

1 Introduction

Exercising daily is beneficial to everyone's health, but many do not exercise often enough. As media becomes more readily available due to an increase in entertainment products, people spend more time on these devices and participate in less physical activities. We are exploring ways in which interactive educational technology can be used to diminish and hopefully reverse this effect. We hope to see the design of mobile interfaces that implicitly act as educational trainers, persuading users to be physically active. Our current *Mootchi* prototype is an early example for this vision.

The use of interactive technologies to encourage users to exercise is not a new idea, but such devices often require the user to look at a screen, perhaps on a PC or a mobile phone, in order to benefit from the interface. When a user forgets to check the device, the exercise reminder is hidden and can be avoided by an unmotivated user.

In contrast, let us consider a person's relationship with pets. Dogs, for example, who want to go for a walk are hard to ignore. A dog will pester and beg until its owner walks it. The dog is a physical entity with which the owner has a close emotional relationship, a relationship that makes it hard for the owner to neglect the dog's physical needs. *Mootchi* is an attempt to create an implicit educational training system based on emotional persuasion, similarly in essence to the one in the owner-pet relationship. It is a mixed reality pet, projected by the user's mobile phone onto her environment. *Mootchi* is quite emotionally expressive, and its emotional state is directly connected to the amount of physical activity *Mootchi* senses through the phone's accelerometer. When it is unhappy, the user is reminded to walk *Mootchi* until it cheers up again (Fig. 1. a).
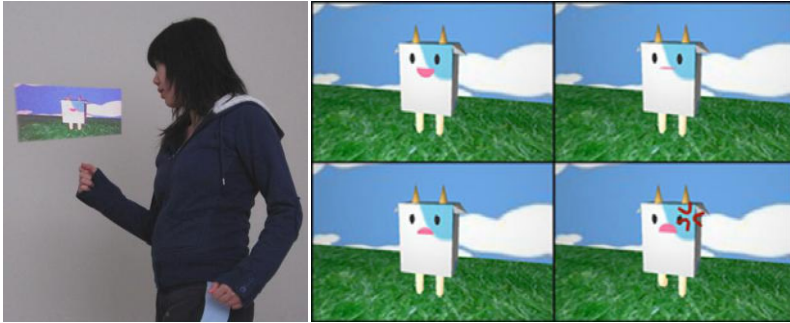
Fig. 1. a. Going for a walk with *Mootchi*. *Mootchi* is projected onto the wall by wearing a portable projector on the user's shoulder. **b.** *Mootchi*'s four moods: happy, neutral, sad, and angry.

Unlike previous virtual pets efforts *Mootchi* does not live on the screen of a mobile phone, but a mixed reality entity projected onto the user's workspace, wall, or any other flat surface in the user's vicinity. In this way, *Mootchi* is an integral and continuous part of the user's physical environment, thus harder to ignore and neglect.

2   Related Work

Lin J. J. et al. [3] uses the growth of a fish running on a mobile phone to keep track of user's exercising progress. Our approach shares many of the concepts with Lin's research, but *Mootchi* attempts to create an emotional bond with the user, in hopes that the commitment is not for the workout per se, but rather for *Mootchi*'s happiness. As *Mootchi* is projected onto the user's workspace, it is also harder to ignore than a mobile device that can be hidden in a pocket or bag.

Dillahunt T. et al. [1] studied how different degrees of emotional ties to a virtual animal can encourage environmentally friendly actions. A Flash-based virtual polar bear and its habitat showed the user that environmentally friendly actions increased the size of the bear's iceberg. This study found that those with a stronger attachment to the animal were more committed to environmentally friendly actions in the short term. Similarly, we hope that the emotional attachment to *Mootchi* will elicit a stronger commitment to perform the physical activity that *Mootchi* craves.

Mootchi is designed as a persuasive social actor, one that users can create an emotional bond with, and can be treated as if it were alive. According to Fogg B. J. [2], social actors give users positive feedback, model a target attitude, or provide social support. *Mootchi* provides positive feedback when the user exercises by becoming happy. When users perceive an application as a social actor, Fogg argues that the application has a higher chance of persuading and motivating users.

Tamagotchi was very well received by children and young adults, and many became attached to it emotionally. Similarly, Nintendo's Pocket Pikachu is a virtual pet living on the screen of a pedometer. The objective is to walk Pikachu in order to gain "watts" to feed it. Our design incorporates the pet attributes these interfaces, but augments it with a stronger relationship with the physical world. *Mootchi* is projected onto the user's environment and thus becomes a mixed reality pet that is more persistent and graspable, and constantly sharing the environment with the user.

Fig. 2. A user browses the web and glances over to check on *Mootchi*

3   Mootchi Prototype

Mootchi was prototyped as an Apple iPod touch app (Fig. 1. b). A MicroVision SHOWXX Laser Pico Projector was used to project it into the user's surroundings. In the short term we hope that *Mootchi*-like interfaces can be designed around mobile phones with built-in projectors (such as the LG Projector Phone).

   Mootchi has four moods: happy, neutral, sad, and angry, and its facial expressions show what mood it is currently in. When the user is sitting to work or watch TV for example, the projector can be placed on a desk projecting *Mootchi* onto a nearby wall so she will see *Mootchi* at all times (Fig. 2). The user may also choose to wear the projector on her shoulder or calf while walking with *Mootchi* so she does not have to look at the iPod touch to check *Mootchi*'s current mood while exercising.

4   Preliminary Design Critique and Results

We asked two students from our lab to play with *Mootchi* as part of a preliminary design critique. *Mootchi* was projected onto a wall next to a laptop (Fig. 2), and the participants were told that walking *Mootchi* would make it happy. Due to time constraints, *Mootchi*'s mood changed more rapidly than it normally would. In the first phase, the participants browsed the internet, classified as an activity that is not extremely engaging. The participants were asked to refrain from watch any videos. In the second phase, the participants watched a short movie as a more engaging task.

   In the first phase of the design critique, both participants noticed *Mootchi*'s mood changes quickly, and proceeded to walk *Mootchi* until it became happy again. However, in the second phase, both resorted to shaking the iPod touch to simulate the effects of walking so they can continue to watch the movie without interruption. One of the participants reflected that *Mootchi*'s mood changes were so subtle that during the movie-watching phase, the mood changes went unnoticed at times.

   Although both participants liked *Mootchi*, they both said they would turn it off or ignore it when doing a task that involves concentration. Neither of them liked the idea of using the projector while walking. One said that she would feel embarrassed if others saw that she did not take good care of it.

A participant said she was guilted into walking *Mootchi*, and was definitely motivated by it. She felt obligated to keep it happy. The other participant was not motivated to walk around for *Mootchi*'s happiness, and would walk *Mootchi* only as an excuse to procrastinate. He suggested letting *Mootchi* evolve as the user exercises. If the exercising goal was not met, then it should devolve or even die. He believes that this may increase users' attachment to *Mootchi*.

5 Conclusion

The participants' awareness of *Mootchi*'s mood changes during the first phase compared to the second enforces our perception of the lower/higher engagement requirement for the tasks chosen. When *Mootchi* becomes an integral part of the user's living space, its presence may diminish because it does not have attention-grabbing animations. Giving *Mootchi* flashier animations may alleviate this problem.

The suggestion that *Mootchi* will be able to affect the user more if it can grow and die is a valid point. Evolution is a large part of the Tamagotchi gameplay, and the virtual pet's mortality gives an incentive for players to care for it properly.

Both of the participants enjoyed playing with *Mootchi*, though only one was motivated to go for a walk to make it happy. Because of the different reactions to *Mootchi*'s needs, a more intensive study should be conducted to confirm our results.

Mootchi is a mixed reality pet that attempts to encourage users to perform physical activities such as walking or jogging by using both emotional attachment and physical integration with the user's environment. By becoming a social actor, *Mootchi* creates an emotional bond with the user so the user will care about *Mootchi*'s happiness. We believe that *Mootchi*, once some of the current prototype's limitations are resolved, has great potential to urge people to remain physically active, and to become an exercising companion and educational tool for a healthy lifestyle for everyone.

References

1. Dillahunt, T., Becker, G., Mankoff, J., Kraut, R.: Motivating environmentally sustainable behavior changes with a virtual polar bear. In: Workshop Paper, Pervasive Persuasive Technology and Environmental Sustainability (2008)
2. Fogg, B.J.: Persuasive Technology: Using Computers to Change What We Think and Do. Morgan Kaufmann, San Francisco (2003)
3. Lin, J.J., Mamykina, L., Lindtner, S., Delajoux, G., Strub, H.B.: Fish'n'Steps: Encouraging Physical Activity with an Interactive Computer Game. In: Dourish, P., Friday, A. (eds.) UbiComp 2006. LNCS, vol. 4206, pp. 261–278. Springer, Heidelberg (2006)