Exercise Pal Mootchi

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Abstract
Exercise is vital to maintaining good health, but many people do not work out regularly or often enough. There are many reasons why this is so, but one important factor is the lack of will. Physical exercise is often perceived by inactive people as tiring, repetitive and boring, and generally unattractive. Psychological motivation and emotional incentive can play an important role in whether a person would head for a jog or remain in front of their computer or head for the fridge. We propose a virtual pet, Mootchi, which will provide users with an emotional incentive for exercising. Mootchi engages users by expressing sadness from time to time, and asking them to care for it, and help Mootchi regain happiness. Mootchi becomes sad if it's static and idle for too long, and requires physical movement in order to feel happy again. In order to make the emotional state of Mootchi explicit and unavoidable Mootchi is embodied in a portable form, and is being constantly projected as part of the user physical environment. This work-in-progress report outlines our prototype implementation and initial findings based on a design critique.

Keywords
Personal projection, exercise, emotional attachment, mobile interfaces, virtual pet.

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Design.

Introduction

Exercising daily is beneficial to people's health, but many do not exercise often enough due to laziness. Using a program or device to encourage the user through various means to exercise is not new, but these devices require the user to look at a screen, perhaps on a PC or a mobile phone, in order to receive any benefit of the program, namely motivation to exercise. When a user forgets to check the device, or is reluctant to do so, the exercise reminder is hidden and can be easily avoided by an unmotivated user.

In contrast, dogs who want to go outside for a walk are hard to ignore by their owners. A dog will pester, whine, cry and beg until its owner gives in and goes out to walk it. The dog is a physical entity with which the owner have a close emotional relationship. Arguably, in theory specially trained dog could be quite powerful in sending owners to the gym with it if it would cry relentlessly that this is what it wants them to do. In essence this is what our system tries to achieve, to roughly capture some of a pet's emotional attachment, as well as physicality. Using the user's emotional attachment to a virtual pet named Mootchi, when it gets sad or even angry, the user will take the cue to go on a walk with Mootchi until it is happy again (Figure 1). Unlike previous virtual pets efforts Mootchi does not live on the screen of a mobile phone, but is rather projected onto the user's workspace, wall, or any other flat surface in the user's vicinity. Arguably, Mootchi is becoming an integral and continuous part of the user physical environment, and is thus harder to ignore and neglect. We believe that virtual pets like Mootchi which are immersed in the user physical environment will be easier to accept and harder to neglect by users, and that chances are that users will not be able to easily ignore the cute pet's unhappy state, and will be reminded to exercise for the sake of its happiness, and more importantly, the user's own health.

Figure 1: Going for a walk with Mootchi. Mootchi is projected onto the wall by wearing a portable projector on the user's shoulder.

Related Work

Lin J.J. et al. [2] uses imagery and growth of a fish to keep track of user's exercising progress. The fish is runs as an app on a mobile phone that reflects on the user's physical activity progress. The health and size of the fish tells the user without numbers how much exercise he/she is doing and how close to the goal he/she is. . Our approach shares many of the concepts Lin et al. are following, but our design of Mootchi attempts to better resemble a live pet in both the emotional and physical aspects, in hope that these would more effectively motivate the user to exercise. Not only does Mootchi congratulates the user (like Lin et al.), but attempts to create an emotional with the user, so the commitment is not just to the physical activity, but to the virtual pet's wellbeing and 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] on the other hand did a study with different degrees of emotional ties to a virtual animal to encourage environmentally friendly actions. The emotional ties in the study were created by making the users read a touching story about how climate change impacts polar bears' habitat. A Flash-based virtual polar bear and its habitat shows the user that environmentally friendly actions increased the size of the bear's iceberg, and inaction leads to shrinkage of the iceberg. This study found that those with a stronger attachment to the animal were more committed to the environmentally friendly actions in the short term than those without the attachment. Similarly, we hope that the emotional attachment to Mootchi elicit a stronger commitment to exercise than if Mootchi was not used. We also used Mootchi's happiness to attempt to create that emotional tie with the user rather than an unchanging story.

Mootchi Prototype

Mootchi was prototyped using an Apple iPod touch app, with no UI elements except a background, and Mootchi the virtual pet (Figure 2). It has four moods: happy, neutral, sad, and angry, and its facial expressions show what mood it is currently in. It will also sleep from 9:00 PM and wake up at 7:00 AM so that there is no pressure to exercise late at night or too early (assuming the user goes to work at 8:00 AM).

Though in a future work a settings screen for how long each exercise session should be can be put in place, in the current system Mootchi becomes angry from the happy state in half an hour, and becomes happy again with five minutes of walking. Although this seems like very short intervals and even shorter walking time, it is reasonable for those who have to work sitting at a desk throughout the day, and cannot leave for too long.

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 that the user will see Mootchi's mood at all times without having to check a small device that might be forgotten or ignored (Figure 3). Our projector of choice was Microvision's SHOWXX Laser Pico Projector as it is a lightweight portable projector, and always in focus due to the lasers. The user may choose to wear the projector on his/her shoulder or calf while walking with Mootchi so he/she does not have to look at the iPod touch to check Mootchi's current mood.

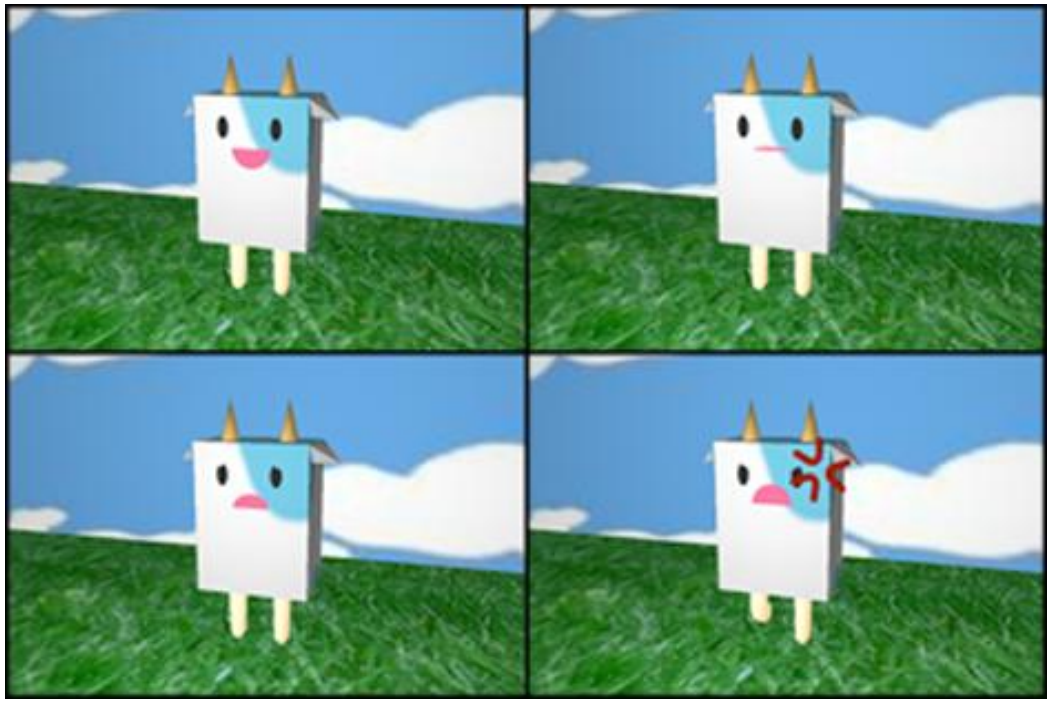

Figure 2: Mootchi's four moods: (from top left to bottom right) happy, neutral, sad, and angry.

In addition to Mootchi's emotional states, it may also show a thought bubble with either a heart or a person walking. The heart is shown when the user is walking Mootchi to indicate to the user that, while Mootchi is still not in a happy mood, the user's current actions (eg. walking Mootchi) are positive and are helping Mootchi become happier. The other thought bubble with a walking person tells the user that Mootchi wants to take a walk, and it is the reason it is unhappy.

In the current prototype, Mootchi does not emit sounds to alert the user to its current state. Mootchi's being merely a projection means that the users can still ignore Mootchi and forgo exercising. However, our design was attempting to reach a balance that will allow Mootchi to express emotional needs to the user, while being part of their physical environment but without becoming an annoying nuisance that may result in the user deciding to turn Mootchi off.

Preliminary Evaluation and Discussion

We asked two people from our lab to play with Mootchi and give us opinions afterwards as part of a design critique. The evaluations were done individually.

Mootchi was projected onto a wall next to the laptop (Figure 3), and the participants were told what Mootchi wants to do when it shows sadness. Due to the time constraints, Mootchi's mood in these sessions decreased and increased much faster than it normally should.

In the first 11 minutes of the session, the participant browsed the internet. We classified it as a very common activity that is not extremely engaging, and the participants agreed. In the next 11 minutes, the participants were shown a short animated movie which is highly engaging according to the participants.

The first participant noticed Mootchi becoming less happy (from the happy state to neutral) quickly during the first half of the experiment, and walked Mootchi until it became happy again. During the movie phase, the participant walked Mootchi again the first time its mood became neutral. In the subsequent times however, especially when the movie became more interesting, the participant did not walk Mootchi, but shook the iPod touch while sitting and watching the movie to emulate walking.

The second participant also walked Mootchi whenever its mood changed to neutral from happy in the web browsing phase. However, it is clear that after the initial thrill of trying something new, both interest and motivation quickly decreased. Still, the participant persisted in walking Mootchi whenever it became sadder. In the second phase, this participant did not bother to walk Mootchi at all, but did shake the iPod touch when the participant noticed Mootchi's mood. The participant did not notice Mootchi as often in this phase as in the first phase.

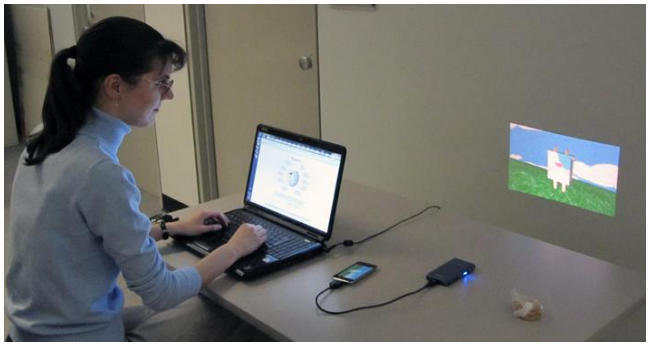

Figure 3: a student browses the web and glances over to check on Mootchi.

When walking Mootchi, both participants looked Mootchi rather than storing it in a pocket. The participants said they enjoyed seeing Mootchi become happy. Neither of the participants liked the idea of using the projector while walking so others can see the pet. One said that she did not want other people to see how badly she was taking care of Mootchi, and the other thought the projector was not powerful or stable enough to make the interaction appealing. However, if technology was not an issue, then he thought it would be a great idea.

Although both participants liked Mootchi, they both said they would have turned him off or ignored it when doing a task that involves some concentration.

The participants liked how the projection could be seen with their peripheral vision, so they can continue browsing the internet without having to check a mobile device. Mootchi's mood changes too subtly and the emotions looked too similar for one of the participants,

so during a more engaging activity such as watching a movie, the mood changes went unnoticed at times.

Mootchi's mood went down too quickly as well. This was done because of the time constraint for the design critique, but the participants thought a reasonable time would be 1 hour to 2 hours before calling the user to exercise again.

We believe that most important part of this critique concern whether the participants were motivated by Mootchi to take walks. One participant said she was guilted into walking Mootchi, and was definitely motivated by Mootchi to go on walks, if reluctantly. She felt as if she was baby-sitting Mootchi, and felt obligated to keep it happy. The other participant was not very motivated to walk around for Mootchi's happiness. He would walk Mootchi only as an excuse to procrastinate.

One suggested adding a happiness meter to know exactly how happy Mootchi is, without having to guess whether Mootchi's happy mood means 100% happy or 90%. Another suggestion was to let Mootchi evolve into different pets, or grow bigger as the user exercises. If the exercising goal was not met, then Mootchi should devolve or become smaller, or even die. This may increase users' attachment to Mootchi, motivating them to exercise even more.

Future Work

From the design critique, it is clear that although Mootchi was quite successful at some of our design goals, such as getting the user's attention during semi-engaging tasks and appealing to the participants emotions (to some degree), there are still many aspects of its design that can be improved and tested.

Giving Mootchi several evolutions, or allowing the user to physically poke, or even feed Mootchi may foster the emotional attachment from the user to Mootchi, but it must be verified in an evaluation.

The design critique also showed that Mootchi did not manage to motivate both participants, so further study on what kind of users Mootchi appeals to and on the short and long term effects Mootchi has on users' daily exercise can be explored.

Conclusion

We presented the design Mootchi, a work-in-progress virtual pet that attempt to encourage users to perform physical activity by using both emotional attachment and physical integration with the user's environment. Through the use of emotions, Mootchi creates an emotional bond with the user so the user will care about Mootchi's happiness. We believe that Mootchi has great potential to urge a user to take short walks after being inactive for some amount of time sitting at a desk, although, and as our design critique demonstrated, ultimately it is always up to the user to exercise (or not).

References

[1] Dillahunt T. et al. Motivating environmentally sustainable behavior changes with a virtual polar bear. *Pervasive 2008 Workshop Proceedings* (2008), 58-62.

[2] Lin J.J. et al. Fish'n'Steps: Encouraging Physical Activity with an Interactive Computer Game. *Proceedings of UbiComp '06,* 261-78.