
Social Yoga Mats: Reinforcing Synergy between Physical and Social Activity

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Abstract

This paper discusses our early research into the design space for digital technologies that extend the existing synergistic relationship between physical and social activity from fitness centers to the home. We focus on yoga activity for senior citizens and explore the concept of *social yoga mats*, which spread awareness of individuals' exercise activities within a peer group. We describe the concept, hardware sketches, exploratory co-design process and discuss our findings and early reflections into this design space.

Keywords

Seniors, yoga, interaction design, ticket to talk.

ACM Classification Keywords

H5.m. Information interfaces and presentation

General Terms

Design

Introduction

This project looks into opportunities for designing digital technologies that benefit the physical fitness and social wellbeing of senior citizens, both of which are considered important for healthy ageing. As a point of departure, we look at the synergy between physical and social activities that exists at fitness centers and explore the design of technologies that can help extend

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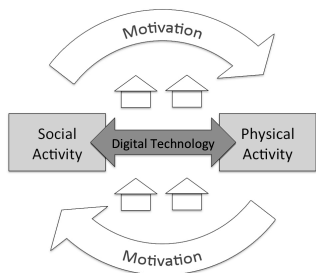


Fig. 1. The synergistic relationship between social and physical activity extended to homes through digital technology.

and strengthen this synergy in the home (Fig. 1). We chose to focus on yoga as a physical activity because of its popularity among seniors and its pattern of regular home exercise plus weekly classes (Fig. 2).

This paper introduces our basic understanding of the ways in which social and physical activities reinforce one another and provides a possible scenario for how the social yoga mats could help strengthen this relationship for senior citizens involved in yoga classes. We then explain the process through which we realized and explored this concept and describe the hardware sketch in detail. Finally, we discuss early insights and reflections based on our explorations so far.

The Synergistic Relationship of Social and Physical Activity

Social motivations to exercise

Several studies show that combining exercise with social activity can help provide motivation. Ahtinen et al., in their research into creating wellness applications for mobile phones, point out that, "Performing with others provides social support, a feeling of team spirit, an opportunity for social learning and a pressure to begin and continue with the activities," [1]. Also, in a study done by Laverie, the following social elements were found important for motivating participation in aerobic exercises: forming social connections, social support, companionship, being part of a group and social comparisons [4]. Romero et al. describe their case study based on the use of physical and social activity as mutual motivators. Their resulting concept, *Activator*, employs a playful, persuasive approach that provides awareness of social and physical activities within the setting of a senior care center [5]. Our work is based on similar notions but focuses on a specific

physical activity (yoga) and its dynamic pattern of practice over time and space.

Physical activities as tickets to talk

For seniors feeling socially isolated, participation in group activities, including fitness, provides regular meetings and shared experiences that can make socialization easier. The goal of improving one's physical fitness is accepted by all as reason enough to participate, so the possible added desire for companionship can remain unstated and ambiguous. Group exercise can therefore become a "ticket to talk," providing an opening for social interaction while avoiding the stigma associated with asking explicitly for relief from loneliness [8].

Scenario

Margaret (age 65) and her friend Lene (67) join a weekly yoga class at the local community center. The instructor provides them with a social yoga mat and a digital picture frame for practicing at home.

Later that week, as Margaret is having her morning coffee, she notices the picture's frame glowing softly. She then looks at the screen and sees that Lene's avatar is standing up. She knows this means that Lene is doing her yoga exercises for that day. Soon afterwards, the avatar for Anette, another friend from the yoga class, also stands up. Each avatar includes a colored indicator showing how active each class member has been in recent days: red for low, green for medium and blue for high activity levels.

Margaret is reminded of her good intentions to keep up with her yoga and decides that now would be a good time to do it. It helps Margaret to know that her friends

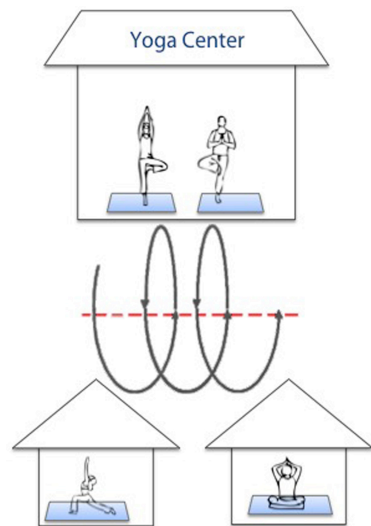


Fig. 2. Continuum of yoga over time; traversing from face-to-face meetings at the center to the home environment and back again.



Fig. 3. Hardware sketch for social yoga mat in use.

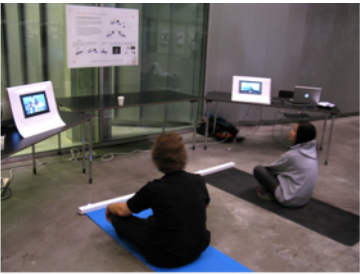


Fig. 4. Demonstration of social yoga mats during Open House.

will see that she is sticking to her commitment. As Margaret unrolls her social yoga mat, a light on the mat begins to glow with a color that reflects her own recent history; it pulses with a second color to indicate that other members of her class are exercising too. The on-screen avatar also reflects her participation so other class members can see that Margaret is exercising now. Several of the social aspects of the yoga class have thus been extended into her home.

At the next yoga class, Margaret, Lene and Anette talk together, congratulating one another for keeping up with the exercises. They also wonder why another class member, Ditte, has not been active all week and decide to give her a call after class to make sure she is OK.

As the days go by, Margaret and Lene notice that they are always exercising around the same time on Tuesday, so they begin to call each other afterwards and occasionally arrange to meet after exercising.

Method: Sketching and Interviews

Our work follows a research-through-design methodology [9], which is “a research approach that employs methods and processes from design practice as a legitimate method of inquiry” [ibid., p.310]. Following this approach, we ensured early user involvement and applied sketching for reflection and dialog [3], ethnographically inspired methods [2] and a reflective, recursive process [7].

Engaging with seniors

Having selected yoga as a relevant activity, we collected basic ethnographic data by visiting yoga classes for seniors at two different locations, where we learned various yoga exercises, studied the social

dynamic in the class and observed the role of the instructor. We did some informal interviews with the instructor and center coordinator to learn more about seniors, their social life and their participation in yoga. These early studies inspired the initial social-yoga-mat concept, resulting in a working hardware sketch (Fig. 3), which we displayed during an open house exhibition held at our university. Here, we encouraged visitors to try out the system while collecting feedback (Fig. 4).

We built on our initial insights by organizing three formal group interviews with a total of 9 senior yoga class participants (in groups of 4, 2 and 3), where we used our hardware sketches and video prototype to stimulate discussion. We also asked in detail about their exercise habits, social life and technology use. All participants were Danish women aged 65 to 86.

The social yoga mats concept and sketch

The social yoga mat concept (Fig. 5), consists of three main components:

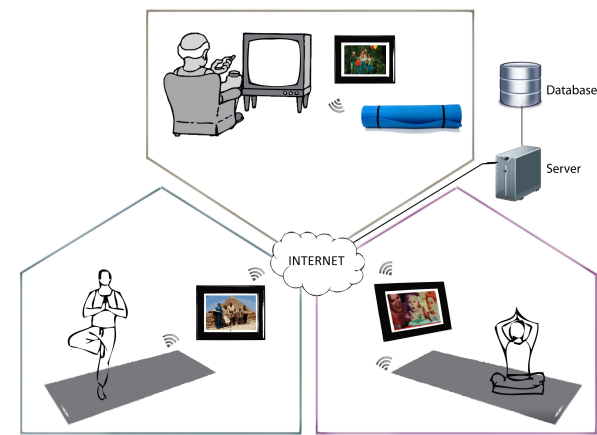


Fig. 5. Social yoga mats system and components.

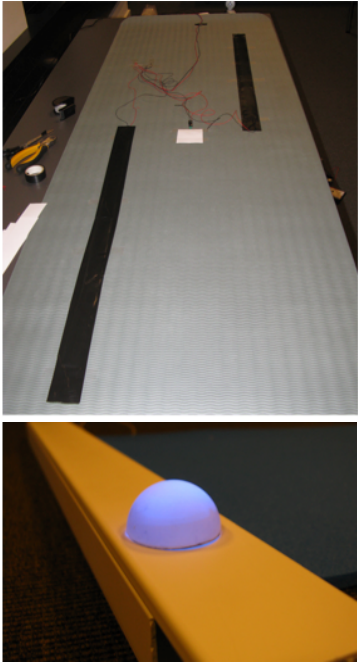


Fig. 6. Social yoga mat details: pressure sensor placement (top); RGB LED to indicate peer activity and user history (bottom).



Fig. 7. Picture frame and avatars. (Photo: Tom Clare / FreeDigitalPhotos.net')

- *Yoga mats* equipped with pressure sensors, Internet connectivity and an indicator light to show the history and peer activity status (Fig. 6).
- *Digital touch-screen picture frames*, which show animated avatars that indicate the history and status of each member of the peer group (Fig. 7). These compliment the yoga mat by opening the possibility for further activity support and detailed social features.
- A central *database and server*, with which all other components communicate when reporting or displaying peer activity (Fig. 5).

Our design appropriates and enhances familiar objects (picture frames) and exercise materials (mats), seeking to minimize the angst associated with foreign technology. It reacts to natural actions (yoga activity) without requiring logging or other explicit computer use.

In our working sketch, the mats are equipped with pressure-sensitive resistors connected to an Arduino board together with a WiFi shield and a full-color (RGB) LED. We simulate the picture frames using laptop computers, where we implement avatar animation and a photo slide show through a Flash program accessed via a web page. The server features are provided by a collection of PHP programs running on an Apache web server with a MySQL back end; the Flash files and photos are also hosted here.

Continuing studies

As our investigation continues, we will install working sketches of the social-yoga-mat concept in the homes of two or more seniors from the same yoga class so

they can have a chance to experience the subtle social effects of the system over a prolonged period.

Findings and Discussions

Adoption of technology among seniors

The seniors we interviewed showed a pragmatic attitude towards new technologies, becoming interested only when they perceived direct benefits. For example: adopting a mobile phone first after experiencing an accident while alone and needing help. In discussions inspired by our sketches, many interviewees expressed interest in more direct support for yoga in particular, expecting features such as instruction, monitoring and/or feedback on exercises. These findings indicate that more specific help, such as providing video instructions and/or evaluating student progress, would probably enhance the perceived usefulness and increase adoption of the technology, thus creating more opportunities for tickets to talk.

Possible reluctance to express social needs

One of the difficulties we experienced during our research is that seniors can be reluctant to express their feeling of loneliness and social needs explicitly. In our interviews, most of the seniors mentioned that their physical activities were entirely motivated by the desire to stay fit rather than as an excuse to be social. However many of their statements suggested otherwise, such as, "[yoga] is very sociable, especially now that I am retired. There are many other seniors there when I come in the late morning, so we get a good chat also." This illustrates that there is room for users to maintain a certain ambiguity of intent when participating in social physical activities, which we consider an important element for designs included in this space.

The social-yoga-mat concept purposely does not demand that users make these intentions clear and therefore provides conditions for tickets to talk. For example, at home people might sometimes exercise to keep fit and other time exercise to feel part of the group and make their presence known for purposes of socializing.

Awareness, motivation and persistence

When discussing the sketches, seniors recognized that the social aspects of the system could help increase the peer motivation to exercise. One pointed out that it would “appeal to your bad conscience” to see that a friend is doing her daily exercise when you had not done so. They also noted that such a system could be useful to help feel more connected with family members and close friends living far away.

Some seniors expressed concern that they would never experience the indicators of simultaneous activity because they all kept quite different schedules from one another. This informs us that it is important to include some awareness information that persists over time.

Research projects such as PeerCare, which focus on remote awareness among peers, have typically been ambient in nature [6]. In contrast, the social yoga mats are tightly coupled with a specific activity (yoga), so the context is always clear, helping to give extra meaning while still maintaining a certain ambiguity of purpose.

Extending social/physical synergy to home exercise

Our observations indicate that shared awareness features can indeed help to extend into the home the

social/physical synergy that exists at fitness classes. For example, interviewees repeatedly made statements reflecting the attitude that exercising to stay fit is an admirable activity that, presumably, they would like others to notice. We speculate that the display of recent levels of exercise activity would encourage members of the peer group to keep up with one another while enjoying the knowledge that their own activities would be seen by others. This dynamic may sometimes become a focus of conversation when meeting at the class. We also speculate that over time, at least some users of the social yoga mat system would begin to notice each other’s daily rhythms, prompting a phone call, e-mail or plans to meet.

Inspiration for a new design space

Following Westerlund’s understanding [10], we consider design space to be a representation of all possible design solutions and a conceptual tool for designing and understanding design. The seniors we interviewed were engaged in a variety of physical activities, ranging from casual (such as walking and biking) to more organized (such as yoga and dance). Our exploration suggests new opportunities for creating design solutions similar to the social yoga mats, but focusing on other activities, which themselves could become tickets to talk while benefitting from the social/physical activity synergy. Also, the insights and design knowledge generated during this exploration can be helpful in articulating the new design space, guiding those interested in designing for seniors with a focus on improving physical fitness and social wellbeing.

Concluding Remarks & Future Directions

Our early explorations indicate a design space for technologies that support and extend the synergy that

exists when physical and social activities occur together. Building on the findings described here, we will seek to further strengthen this synergy by adding more explicit support for yoga activities while also enhancing the communication features to provide more tickets to talk. We see complimentary media, such as the digital picture frame, as playing an important role in achieving those goals.

Though we have focused on yoga activities, the basic concepts and infrastructure outlined here suggest a design space that could easily include other forms of exercise associated with weekly classes, such as Pilates, dance or aerobics. The space could also include support for peer groups united by social structures other than a class, such as families or friends. Also, a variety of display media, such as TV or cell phones, could be enlisted, each providing its own forms of abstraction and tickets to talk.

Because the benefits of social and physical wellbeing are universal—and because we consider social and physical activity to be mutual motivators—designs in this space can be highly inclusive and could encompass situations where there is a lack of motivation towards physical fitness (such as overweight youth or rehab training) or other situations where physical activities could help enhance social interaction (such as facilitating cross-generational communication through physical play).

Acknowledgements

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