Figure 1: Super Wendy is a suit that monitors heart rate, water and food intake, sleep patterns, scheduling, to-do lists, and social interactions. A functioning prototype (top) implemented with Arduino monitors activity patterns using light sensors and accelerometers, measures water intake using water level sensor, and gives real-time feedback via vibration and LEDs. The conceptual design (below) consists a necklace and a bracelet. The necklace is a Bluetooth headset with near field communication, accelerometer, and gyroscope to track food consumption when the bracelet is lift up to or above the neck level and swallowing is detected via movement on the neck. Social interaction is sensed through prolonged Bluetooth connections with devices of friends. The LEDs in the bracelet provide discreet real-time feedback, e.g. flashing blue as a reminder to drink water.

Waiting for Supermom: Opportunities for HCI

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Abstract

HCI research offers special prospects for supporting and empowering women in their role as mothers. In this paper, we present three design exercises that take advantage of novel interaction styles while addressing needs of mothers. Our goal for these design probes is to prompt reflection on opportunities for HCI research.

Author Keywords

Tangible and embodied interaction, motherhood.

ACM Classification Keywords

H.5.m. Information interfaces and presentation

Introduction

The last two decades have given rise to technological advances that bridge the physical and digital worlds. The increasing availability of smart handheld devices and wirelessly connected sensors and actuators in domestic life opens the opportunity to consider these technologies in the context of modern motherhood.

Research has shown that parents are generally more enthusiastic about technology asserting that technological tools give them more control over their lives [1,3]. A diaper genie was once considered state of the art technology for mothers but modern mothers

Figure 2: Nudge is a prototype for long-distance physical communication. The current prototype consists of two touch mice with three motors which vibrate corresponding to user gestures (top). In the conceptual design (bottom) a mother could augment a video chat with her child by nudging or warming the baby's blanket through the touch mouse.
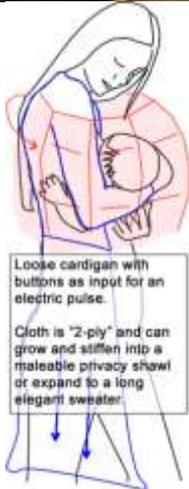
Figure 3: Morphess is an adaptable dress designed for accommodating different activities and demands through shape changing. The current prototype (top) can transform from a simple outfit to an evening gown and back. It's implemented using Lego Mindstorms controller and motors. The conceptual design (bottom) uses push buttons to change the cardigan shape on demand to contract or expand.

need and demand technological solutions that provide support, which extend far beyond simple child-rearing chores. HCI offers special prospects for supporting and empowering women in their role as mothers. We see these prospects arising from the design and realization of interfaces that promote wellness and flexibility, and facilitate mental load. We also suggest that supporting the diverse needs of modern mothers presents an opportunity to discover new knowledge in HCI.

Following, we present three design exercises that explore directions for future work. We present these design probes to prompt critical reflection on the opportunities for HCI research to support mothers. These exercises took place in an advanced HCI course at a women's college.

Waiting for Supermom
Wellness
New mothers often forget to attend to their own physical and emotional needs. Although there are technological tools that monitor fitness and sleep activity [2,4], to date no tools monitor indicators of holistic wellness including: social stimuli, fitness, sleep, and nourishment. Existing systems also fail to alert users in real-time to rectify their actions, instead requiring users to visit a website or an app for a report. Super Wendy (see Figure 1) is a suite of accessories that offer comprehensive wellness support through real-time tracking and feedback.

Flexibility and Mental Load
Multitasking is a constant challenge for mothers that are often juggling between different activities throughout the day such as nursing, to playing with their children, and meeting colleagues. Such multitasking requires mothers to get equipped in

advance with various props for each activities (e.g. a nursing shawl, comfortable clothing, and a formal jacket). Multitasking also creates a high mental load for mothers as they maneuver between their complex schedule and various roles. Morphess (see Figure 2) is an adaptable dress designed for accommodating different activities and demands.

Connectedness
Finally, a challenge for working mothers is keeping in touch with their children, keeping their presence while away. Abundance of options exists for formal communications ranging from text messages to video calls. However, we are interested in means for informal and subtle communications that create a sense of presence and connection. Nudge (see Figure 3) is a system for long-distance haptic communication that allows for such subtle and playful connection.

Summary
We suggest that supporting the diverse needs of modern mothers through interaction design presents an opportunity to construct new knowledge in HCI.

Acknowledgements

References
[1] Allen, K., & Rainie, L. (2002). *Parents Online.* Pew Internet & American Life Project.

[2] Fitbit. (2012). www.fitbit.com/flex

[3] Madden, M., Cortesi, S., Gasser, U., Lenhart, A., & Duggen, M. (2013). *Parents, Teens, and Online Privacy.* Pew Internet & American Life Project.

[4] Nike. (2012). www.nike.com/fuelband