
Understanding Digital Technical Practices around Creative Handwork

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Figure 1. This Spyn prototype was built for the Android 1.5 OS mobile phone environment. Image credited to James Jordan.

Abstract

In this submission, I discuss my design research and fieldwork investigating the digital practices of handcraft practitioners and their surrounding communities. Specifically, I study how creating and sharing digital information around knitting or crochet activity affects the social and material relationships enacted through craft. Here I review my qualitative research on the role of digital resources in creative handwork and the iterative design of Spyn, mobile phone software that associates digital records of the creative process—captured through audio/visual media, text, and geographic data—with physical locations on handmade fabric.

Keywords

Handwork, Handcraft, Craft, Creative Process

ACM Classification Keywords

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

Introduction

A central theme in HCI research has been the study of people's social and informational uses of online resources. In this domain, creative appropriation of existing digital tools has become a prominent area of study (e.g., [8]). Yet little work has explored the relationship between physical and digital creative



Figure 2. The current system (above) was developed for the Android 1.5 G1 phones and uses computer vision to correlate recorded media with locations on fabric. Marie's project for Kristin is shown on the Spyn screen.

processes and the creative communities around them. While information technology is playing an increasing role in physical creative practice, little is known about its affect on the creative practitioner.

My dissertation work aims to fill this gap by studying the ways digital technical practices intersect with physical creative handwork. How do people integrate digital and physical materials in creative work? How do people negotiate control using automated and computer-mediated tools? How people interpret the ways digital artifacts trace or record creative interactions? Focusing on knitting and crochet work, two traditional leisure handcrafts that are growing in popularity, I will address these questions in two stages. First, I will extend the design of Spyn—a tool that associates digital information with locations on handmade fabric. Second, I will conduct a 12-month qualitative study of people introduced to Spyn in order to examine the role of technological content in physical craft practice and, in particular, how people negotiate control and notions of “authenticity” in digitally augmented handwork. By introducing Spyn to an existing online craft community, I seek to more acutely understand how digital tools can be designed to support the continuing development of everyday creative practice.

Background

Blogs, how-to resources, and diverse distribution channels impact the ways creativity is conceived of and enacted by individuals and the communities that they help sustain. In order to extend these practices, HCI researchers have designed tools for offline sites of craft activity that merge craft with electronics to promote educational engagement [e.g., 6]. Others view HCI

itself as a craft—allowing us to suspend “the distinction between tools and materials” [9]. My work focuses on how both digital and physical craft resources influence the value and meaning people attribute to specific objects in the context of social exchange. By studying people’s interactions with digital technologies, I seek to understand the role those technologies can play in enacting craft values, such as creative control, authenticity, and cultural tradition. To study these qualities, my dissertation work builds on two ongoing efforts: 1) qualitative studies of contemporary creative handwork, and 2) a design study of Spyn.

Studying Creative Handwork

The process of creating a handmade object requires a uniquely human investment—one of human pace, one of physical effort, and one of care. Despite its seemingly non-technological orientation [4], handcraft increasingly integrates skilled, creative work with new technology (e.g., [1]). In four separate studies, I investigated the time-honored craft of knitting [5][6][7] and the emerging practice of “IKEA hacking” [1]—people who modify products from the Swedish furniture company IKEA and share their results online. I found that while denying technology direct access to processes of making, knitters and IKEA hackers used technology to support their planning (organizing meetings, yarn swaps), production (finding inspirations, instructions), and social interactions (creating online groups, displaying or distributing products).

Spyn

Spyn is a design study that explores how technology can enrich the creative and social relationships people have with handcrafted artifacts and the people for whom they are made. Over the past two years, Spyn

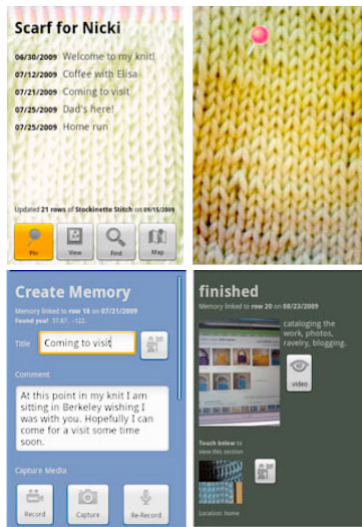


Figure 3. (left to right, top to bottom) (a) Spyn home screen, (b) Pinning garment, (c) creating a new Spyn entry in “Create Memory” screen, and (d) Alicia’s final Spyn entry.

has developed from a design sketch, into a series of prototypes [5], and now a mobile phone application [7]. The phone application uses computer vision techniques to transparently correlate locations on handmade fabric with events— audio/visual media, text, and geographic data— recorded while crafting (see Fig. 1 & 2).

ITERATIVE DESIGN PROCESS

I began my design process by conducting fieldwork in four knitting circles in the Bay Area. Based on the data I collected through observation and semi-structured interviews with recreational knitters, I distilled five design principles for Spyn. First, I determined that the technology should be *Portable*. Since knitters craft in diverse locations and in both personal and public space (on the train, beach, work, home, knitting circles), I designed the technology to capture the places, times and progress of craft activity. Second, I determined the technology should capture the *Process and Invested Time* of craft. Since knitters enjoyed the process of handwork as much as its product (they spent days, months, or even years creating their garments), I decided to make aspects of the knitting process visible on the product by using the physical artifact as a point of reference for digital artifacts. Third, I recognized the importance of *Occasions and Opportunities* with knitting. Knitters were motivated by a variety of phenomena (gifting, seasons, life events) and a memory of those occasions was often connected to the physical object. Fourth, I decided to support *Annotation*. Since knitters annotated their techniques and progress in physical note pads and on knitting websites like Ravelry.com (Fig 5), I designed the technology to enable digital annotation during the process of craft. Lastly, I decided to support *Tactility*.

Since the rhythm created by a knitter's hands, needles and soft materials can be comforting and even therapeutic, I designed the technology to be lightweight, physically unobtrusive, and preserve the existing look and feel of the material.

CURRENT SYSTEM

The Spyn software was written in Java 1.5.0 for the Android 1.5 OS. To attach information to fabric, a person performs three steps (see Fig. 3): 1) photograph the fabric, 2) touch the location on the photographed image of the fabric in which the person would like to attach information, and 3) create a Spyn entry. In step (1) the Spyn software reads the knit and crochet patterns on fabric in order to correlate locations the fabric with digital media recorded while crafting. I designed the vision algorithm to count rows on the sockinette stitch (a basic and well known knitting stitch) at approximately 6 inches from the fabric (see Fig 2). If a garment is too large to fit into the viewfinder, they take several photos in step (1) and the software combines these images. The craft has the choice of skipping step (1) in order to “pin” an existing photo of the fabric. To share the Spyn content, a person can view and interact with the finished piece on the Android phone (Fig. 2) or visit a website (Fig. 4) after the project is complete.

After designing the Spyn system for the mobile phone environment, I observed 12 leisure needle-crafters use Spyn to create one or more handmade garments over two to four weeks and then give those garments to friends, partners and family members. I found that the creation and transfer of digitally augmented items followed the familiar rhythms of craft labor, as investments of time and effort sparked self-awareness,

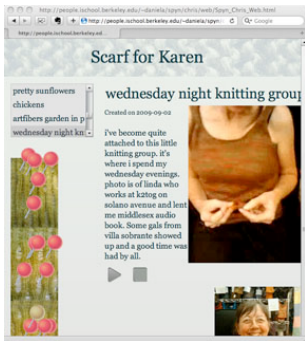


Figure 4. Web-based Spyn project of participant's scarf (bottom left)

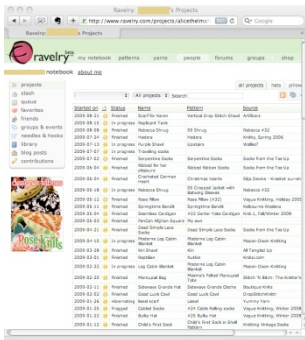


Figure 5. Projects page on Ravelry.com.

creative expression, and demonstrations of care. I also found that the digital became a means for unraveling the value of the gift—craft recipients used digital information associated with the physical objects to interpret the story behind the objects and their creator. By associating digital information to physical form, creators heightened the recipients' appreciation of the gift and the creator's craft process.

Proposed Design and Fieldwork

My proposed dissertation work builds on my previous studies [5][6][7] that suggest digital tools can indeed enhance the creative and communicative processes involved in physical handwork. My next step is to more deeply explore the role of digital augmentation in real-time sharing environments. Toward this end, I plan to investigate the following questions: (1) How does real-time sharing of digital content affect the crafter's experiences of the craft process? (2) How do recipients of the craft object interpret the digital information associated with the object? How does it affect their relationship to the creator? (3) How does the digital information affect the creator's relationship to other crafters within a larger craft community?

In order to begin answering these questions, I plan to first extend the design of Spyn by automating the website-production process. As they use Spyn to "pin" their garments, crafters will be able to post Spyn entries either on a central website or on Ravelry.com (see Fig. 5)—a social networking site created by and for needle-crafters. With over 35,000 members and 265,000 projects, Ravelry has emerged as an important digital resource for sharing and managing craft knowledge. I then plan to release the Spyn software for free public use on Android Marketplace — an online

distribution channel for Android phone applications. Once the Spyn software is posted, I intend to observe how selected users incorporate the Spyn software into their everyday digital and material creative activities.

Conclusions

In summary, my dissertation work aims to understand the role of digital technical practice in handwork by using Spyn to probe the activities of everyday knitters and crochet crafters. By investigating the ways people engage with Spyn during, after, and around handwork, I will contribute to HCI research a deeper understanding of contemporary creative practitioners and the communities around them.

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