E-textiles: *The softer side of computing*

Ann-Marie Horcher
Nova Southeastern University
Ft. Lauderdale, FL
horcher@nova.edu

Kylie Peppler, PhD
Indiana University
Bloomington, IN
kpeppler@gmail.com

Diane Glosson
Indiana University
Bloomington, IN
dglosson@umail.iu.edu

Abstract
This workshop connects attendees with a new area of computing, e-textiles and soft computing. Traditionally technology has been engineered with rigid materials, using assembly skills such as wiring and soldering. The new field of computational textiles explores using fabric in combination with sewn conductive thread to assemble computationally-enhanced textile materials. This workshop will engage attendees in constructing their own sewn circuit project, the precursor for more complex computationally-based e-textile projects.

1. Introduction

Wearable computers follow the same trends as other clothing – the modern wearer prefers materials that are comfortable against the skin, such as textiles, in a fashionable presentation [1]. Reformatting the function of stiff wires and hard plastic into non-traditional soft materials requires a designer to re-think the conventional shapes and assumptions made in computer construction. Early personal computers were built by hobbyists from kits [2]. This hands-on experience brought wider acceptance of personal computing. Similarly, interest in robotics has been sparked by the use of Lego-based kits [3] to build one's own robot. Hands-on experimentation with computationally-enhanced materials in a social setting is proven to generate both interest and success in new technologies [4].

2. Methods

The introduction of e-textiles as crafts can be broken down into various categories, such as electronic (e.g., placement of electronics), fabric (e.g., decorating), and software (e.g., programming) projects [5]. For example two projects that met all three categories included a wearable bracelet and an electric tank top constructed by attaching LEDs to a fabric substrate to create a wearable equivalent of a Lite-Brite design. The wearable can be programmed to display simple animations. However, technologies like the LilyPad Arduino have progressed beyond a mere animation display to include the physical sensing of movement, temperature, light, and the ability to emit vibration and sound connected through wireless technology [6]. It has inspired projects like the Teeboard, which uses a pre-assembled kit; a t-shirt with a embedded Lily Arduino system-board [7].

3. Activities

This workshop uses a hobbyist-style kit to give the participants hands-on experience with creating a simple sewn circuit. The participants transform an object of their choice, such as a lanyard, tote bag, t-shirt or nametag with a set of electronic supplies (i.e., LED, battery, switch) and conductive thread [8]. Participants will leave the workshop with a working simple circuit as well as a better understanding of e-textiles.

Conclusions

In the growing field of e-textiles, is the future one of mass-production or one-of-a-kind construction?Though clothing can be bought ready-made, there is growing DIY movement that prefers to make one of a kind productions. This movement has recently been popularized by television shows like Project Runway, which challenges a diverse group of designers to create fashion out of unusual materials. Putting these new computing construction materials into the hands of the next wave of designers can similarly inspire them to shape this new landscape of computational textile designs, creating a new e-fashion industry.

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