CREATIVE PROCESS | BY ANNET COUWENBERG

Smart Textiles at MICA

AS FORMER CHAIR of the Fiber Department at the Maryland Institute College of Art (MICA), Baltimore (1989–2008), I have enjoyed developing the fiber curriculum, which encourages students to analytically explore fiber in the fine and applied arts. As technology has become a larger part of everyday life, the fiber program has grown to offer courses examining digital advances in fashion.

In the fall of 2009, James Rouvelle, interaction design and art professor, and I co-taught Smart Textiles Research Lab: Wash and Wear Technology—a hands-on seminar where students could analytically explore the design and possible applications of smart textiles, or interactive, wearable electronic fabrics. Throughout the class, Rouvelle and I provided basic instructions for clothing construction and programming techniques. Students learned fiber skills applicable to future work in a wide range of industries, such as biomedical engineering, digital imaging, and interaction design.

Rouvelle, the technical expert, introduced the class to essential tools including the LilyPad Arduino, a small wearable and washable computer about the size of a silver dollar, and light-emitting diodes (LEDs), tiny low-energy light bulbs that respond to an electric signal. Much of this technology is so new—textiles have only been around for a few years—that Rouvelle, the students, and I simultaneously discovered how to work with the tools through online resources. The website of Leah Buechley, designer of the LilyPad Arduino and assistant faculty member at the Massachusetts Institute of Technology (MIT), provides an excellent introduction to all of the necessary components and programming software at web.media.mit.edu/~leah/LilyPad.

Throughout the course, students were encouraged to consider how their work could be placed in society. Engineers and artists alike attended the final critique of the semester and gave insightful feedback regarding the potential of the students' prototypes.

Signals, by Anna Obikane (class of 2011), is a system of two wearable accessories, similar to walkie-talkies, in which one LilyPad Arduino speaks to another through the LilyPad XBee, a sew-in wearable radio created by Rob Fahudi and Kate Hartman. The sender can transmit

ABOVE: LilyPad Arduino component.
BELOW, LEFT: Students programming their LilyPad projects at MICA. Faculty members Annet Couwenberg on the left and James Rouvelle on the right.
BELOW, RIGHT: Conductive thread and electrical wire. Photos by Steven M. Cummings, unless otherwise noted.
light messages to the receiver, such as instructions on which direction to turn, even when the two pieces are in different rooms. This system has the potential to be applied to navigational systems or in theater productions, giving actors stage cues from the director.

Sarah Ivancic (class of 2011), created Proximity Collar, a metal collar with an infrared movement sensor and a LilyPad Arduino that triggers LED lights when an object or person comes close. If a person invades the intimate space of the wearer, (about eighteen-inches) the visual warning of six red lights is set off. This idea of limiting and defining an area of movement, as seen in fences, could be explored in a variety of further applications.

To expand the interdisciplinary aspect of this initiative, MICA will partner with Johns Hopkins University, also in Baltimore, in the fall of 2010. This new collaborative endeavor will provide exciting opportunities for undergraduate artists and engineers to work together in the Smart Textiles Research Lab course to further explore wearable technology, material science, and smart textiles.

Additional digital fiber initiatives at MICA have included explorations in fabric printing, embroidery, and knitting classes. Since 2007, Piper Shepard has taught the Pattern and Digital Print on Textiles course with a Mimaki TX2 digital textile printer. The course's structure explores several key conceptual questions: How is digital textile printing used in art and textile design? What can the textile printer do that cannot be done by hand?

How does this affect and extend the way we think about printed fabric?

During the class, students create projects by developing repeat patterns, after looking at pattern history and methods. Next the class examines the engineered print, which is essentially a pattern being placed into a specific area of a design or three-dimensional form. The digital printer enables the students to explore extensive possibilities of cloth and form making, which becomes evident through post-print manipulation. The students' investigations include manipulations, such as over-dyeing and printing, resist techniques, discharge printing, piecework and embellishment. The course includes workshops and critiques with designer and Rhode Island School of Design, Providence, faculty member Gina Gregorio, as well as visits to design studios utilizing digital textile printing.

Pancopic: An experimental Fashion Event will be held at MICA on April 3. www.mica.edu. To learn more about LilyPad Arduino technology and software, visit web.media.mit.edu/~leah/LilyPad.