

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Textile Society of America Symposium  
Proceedings

Textile Society of America

---

2000

## From Upholstery to Installation: Educating Designers and Artists Using an Electronic Jacquard Loom

Deborah First

*Textile Society of America*

Follow this and additional works at: <https://digitalcommons.unl.edu/tsaconf>

---

First, Deborah, "From Upholstery to Installation: Educating Designers and Artists Using an Electronic Jacquard Loom" (2000). *Textile Society of America Symposium Proceedings*. 794.  
<https://digitalcommons.unl.edu/tsaconf/794>

This Article is brought to you for free and open access by the Textile Society of America at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Textile Society of America Symposium Proceedings by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

# **From Upholstery to Installation: Educating Designers and Artists Using an Electronic Jacquard Loom**

by Deborah First

## **Introduction**

In the fall of 1998 students and faculty in the fibers department at Savannah College of Art and Design began to use their newly installed AVL electronic jacquard loom (figure 1).

Since its arrival, students have explored the loom's capabilities for designing and producing samples for the textile design industry as well as using it as a tool for art making.

Students preparing textile design portfolios study woven structure and its relationship to image-based digital design directly through their use of the loom and the design software. Because they weave their designs independently of a technician, there is much flexibility for modifying and refining designs, and then re-weaving, all in a relatively short time period. Rather than relying solely on simulations of weaves, students create actual woven samples and short lengths of fabrics. This process enables students to push their designs further and to work more inventively.

In addition to this design application, other students are pursuing art-based ideas with the jacquard loom. Images and structures that were otherwise prohibitively time-consuming or technically complex are now possible with a loom that has 1,728 individually controllable warp threads. Students are attracted to its ability to reproduce and re-interpret imagery from a variety of sources, including their own photographs and drawings. Beyond the image-making function, students are investigating woven surfaces and structures possible with the new technology, and are experimenting with a variety of non-traditional weft materials and finishing processes. They are also beginning to explore the combination of jacquard-woven fabrics with other media.

## **Context**

The fibers department at Savannah College of Art and Design has approximately 50 students from all over the United States, as well as Mexico, Central and South America, Asia, and the Middle East. There are four faculty teaching in the department and we offer both an undergraduate and a graduate program. Fibers is one of eighteen majors at the college.

After taking foundation drawing and design courses, students take courses that introduce them to textile processes and sensibilities. They study weaving, screenprinting and other surface design processes, repeat pattern, three dimensional fibers and history of fabric. From this base, they pursue a variety of textile design and fine art areas.

Computer Aided Jacquard Design is one of several electronic design courses that are textile-specific. Other courses explore textile print design and dobby weaving.

### **The Loom and Software**

The AVL jacquard loom has a wooden frame built by AVL, a California-based company known for its dobby and computerized dobby looms. The loom is outfitted with a steel frame that supports three electronic jacquard heads manufactured by TIS, a French company located in Lyons, France. The loom is not a power loom, but a hybrid of a handloom and a jacquard. The loom has 1728 hooks, each of which controls one heddle (and one warp thread) independently. The independence of each warp thread provides for great flexibility of repeat size. One repeat could use the full width of the loom or a division of it. The sett, which is variable, is currently 60 ends per inch, for a weaving width of approximately 27".

The software we are using is NedGraphics, a Dutch software that has modules for print and jacquard design. It runs on Windows 95/98/NT operating systems.

### **Teaching Method**

Students are required to take Computer Aided Surface Design as well as a basic weaving course as prerequisites for the jacquard course. In the introductory jacquard course, students first design and weave sample blankets as a way of learning the jacquard software and exploring simple and complex weave structures. Because the students in the course are generally seniors or graduate students, most are already pursuing a personal design or fine art direction. The projects they pursue reflect the diversity of their interests and include individual designs and collections for textile design portfolios or one-of-a-kind fabrics for fine art applications.

In spring 2000, a more advanced jacquard course was offered. This course explored more complex structures, including the use of supplementary wefts and multiple warps. In addition students explored variation in sett within one design, as well as the use of non-traditional materials.

### **Design Process**

Using the NedGraphics program Texcelle, students create an image file that is the starting point of the jacquard fabric. Occasionally students draw directly with the computer to generate their images, but more frequently they scan in line drawings or even gouache paintings as a starting point. After the image is reduced in color and otherwise adjusted to make it suitable for a jacquard, it is taken through a series of steps using the NedGraphics Weaver NT software. The steps include assigning a weave to each design color, as well as entering technical information about the size of the design, the number of warps and wefts used, and the size and structure of selvages.

When the weaves have been assigned and the other technical information has been entered into the Weaver NT, the weave file is ready to be exported so that it can be read by the TIS software that controls the loom. The weaver is then ready to test the

design. Revisions to the design are often necessary, and because the loom is just a few feet away from the design computers, corrections are easily made. It is common to make changes affecting weave structures, design size, and weft use (filling color and material) at this point. It is often difficult to predict how well some weaves will work, so new weaves may need to be assigned if certain areas of the design lacks contrast, become too busy, or simply do not work technically. Also, because of variations in the number of picks (wefts) per inch, a design might become distorted without an adjustment to its size. A fine yarn may require a larger number of wefts per inch than anticipated, compressing the design, or conversely, if a weft has fewer picks per inch than planned, the design would become elongated. Based on the weave tests, the height of the design might need to be lengthened or shortened in proportion to the picks per inch. Changes to the weaves or design size are made relatively quickly using the NedGraphics software.

This process of designing, testing, and revising contrasts greatly with the technology that preceded electronic jacquard design. Previously, the jacquard design would be meticulously painted on point paper; each tiny block of the design represented a raised or lowered warp thread. Cards that controlled the operation of the jacquard head were punched and laced together in a lengthy process. One card was required for each weft in the design repeat. Unlike the current technology, which allows corrections to be made with a few keystrokes, modifications to the design required punching new cards: A mistake in the design was catastrophic!

The images that follow the text illustrate the design process and show a sampling of student explorations in both textile design and fine art applications.

### **Student Design Work**

**Figures 2-4.** Graduate student Selinde Lanier's upholstery fabric Astoria illustrates the process of design revision. Figure 2 shows a detail of the final result of this single warp, multiple weft construction. Figure 3 shows a preliminary test in which leaves and buds lacked definition. In figure 4, the weave structures for these areas were made more weft-faced.

**Figures 5- 7.** Graduate student DeAnna Rigter used a variety of natural forms as inspiration for these single warp, single weft designs for upholstery.

**Figures 8-10.** Thai graduate student Vilasinee Sirimanapong explored her ancestry through this series which included one-of-a-kind panels, as well as designs for upholstery

**Figure 11.** The use of non-traditional wefts, such as raffia, are possible since the is woven in by hand.

**Figures 12-13.** Variations of density are explored in this fabric by Selinde Lanier. Negative spaces between amaryllis flowers use only half the warps as the rest of the fabric. The floating warps are clipped after weaving.

## Fine Art Applications

**Figures 14-17.** Thai graduate student Piyanat Arphorn wove a series of pairs of fabrics contrasting architectural details from her country with those of her new environment in Savannah, GA. Figures 14 and 15 explore windows; figures 16 and 17 depict columns.

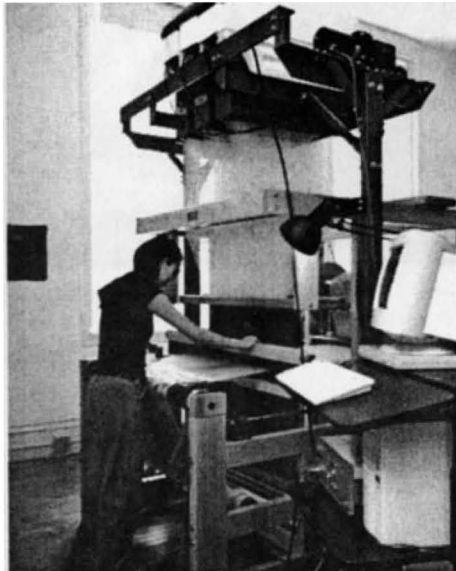
**Figures 18-20.** Graduate student Ann Heintz scanned collages from her notebooks and handmade books, as well as her own photographs and other found images to create a series of black and white single cloths.

**Figure 21.** This installation by Ann Heintz combines jacquard weaving with found objects and dyed and printed fabrics. Monofilament double cloths have pockets that contain jacquard fabrics.

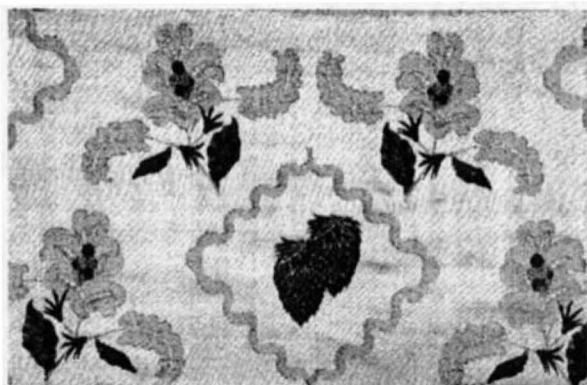
## Conclusion

We are just beginning to explore this new technology which marries electronics with the hand. The ability to scan in drawings, photos, text, and other imagery offers seemingly endless possibilities. The flexibility of exploring variations in fabric density, materials use, and finishing processes creates many new possibilities, as does hand manipulation of the cloth during and after weaving. It will be exciting to see further investigations of imagery, combined with an attention to the material nature of the woven cloth. The potential is great.

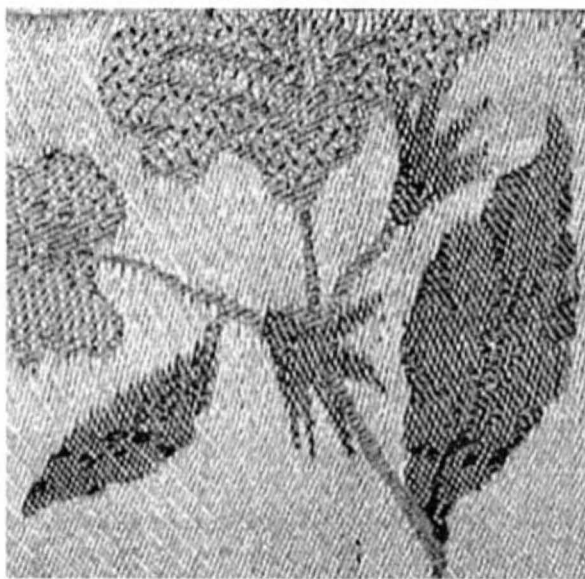
## Illustrations



**Figure 1.** AVL Jacquard loom at Savannah College of Art and Design

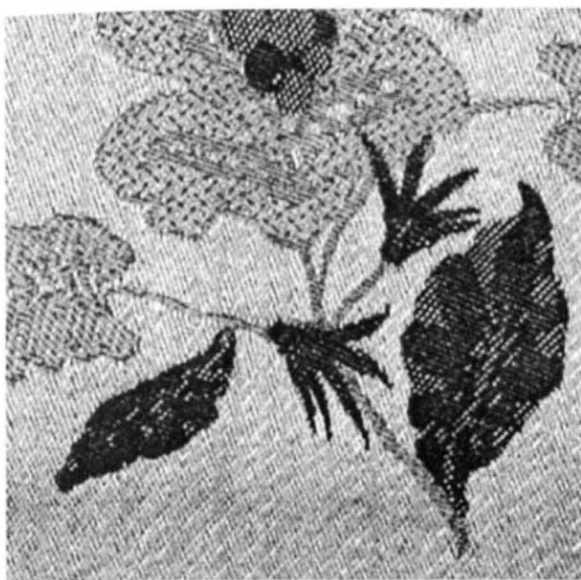


**Figure 2.** Selinde Lanier, Astoria



**Figure 3.** Selinde Lanier, Test for Astoria (detail)





**Figure 4.** Selinde Lanier, Test for Astoria (detail)



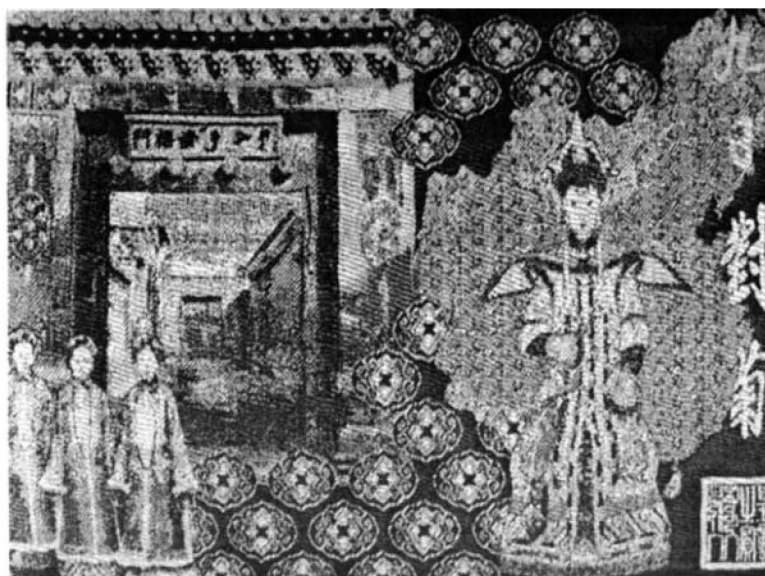
**Figure 5.**  
DeAnna Rigter, Jacquard upholstery design



**Figure 6.**  
DeAnna Rigter, Jacquard  
upholstery design

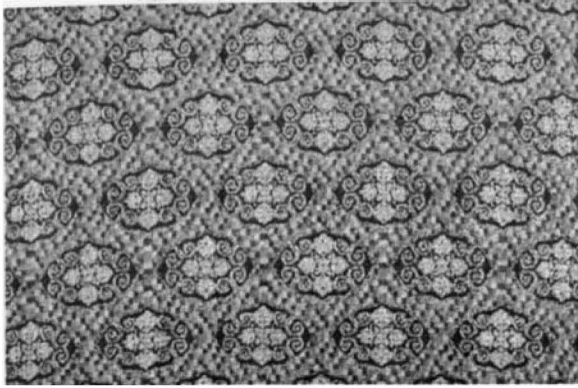


**Figure 7.** DeAnna Rigter, Jacquard upholstery design

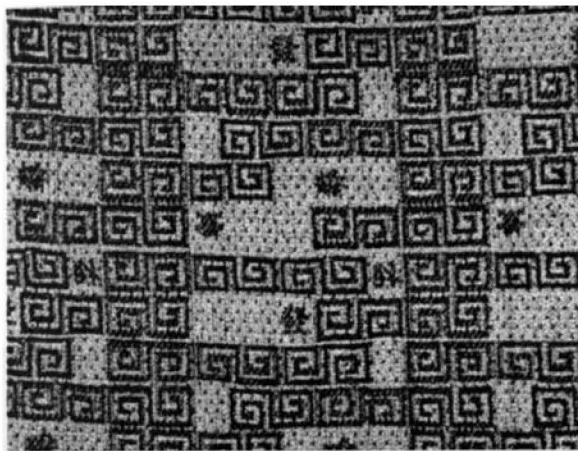


**Figure 8.** Vilasinee Sirimanapong, Jacquard panel





**Figure 9.** Vilasinee Sirimanapong, Jacquard upholstery design



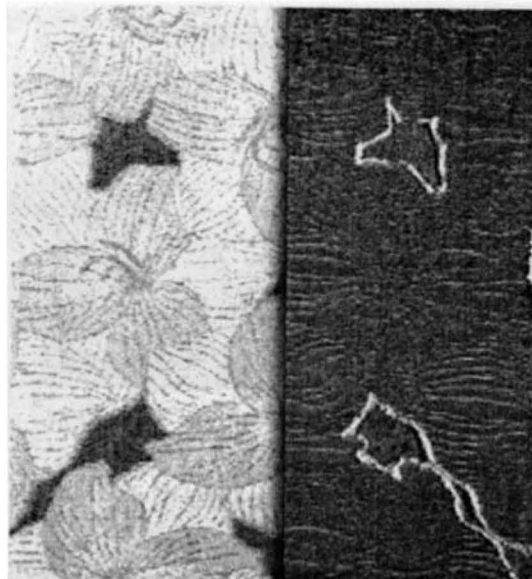
**Figure 10.** Vilasinee Sirimanapong, Jacquard upholstery design



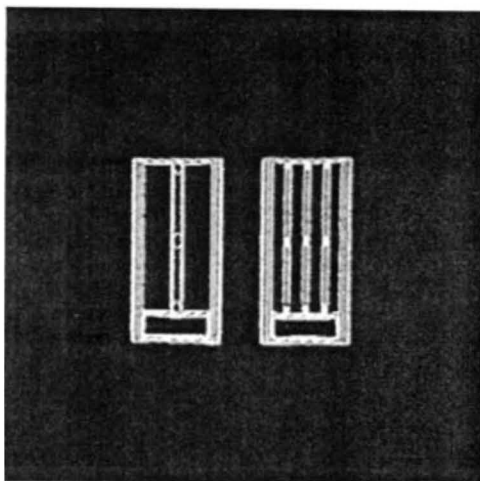
**Figure 11.** Laurie Lovell weaving raffia weft into a jacquard she designed.



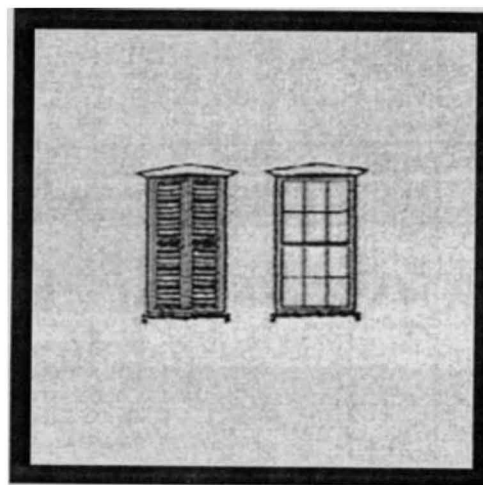
**Figure 12.**  
Selinde Lanier, Amaryllis (detail)



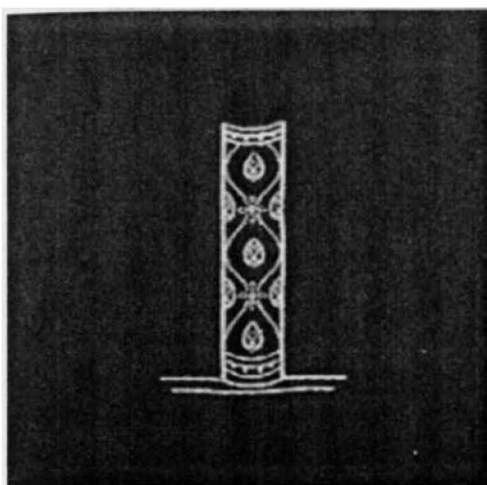
**Figure 13**  
Selinde Lanier, Amaryllis (face and reverse  
showing cut warps.



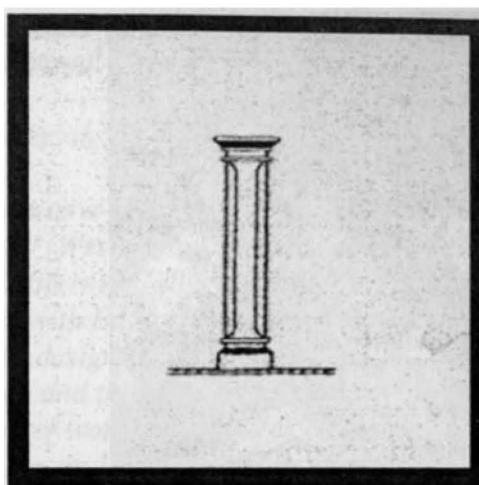
**Figure 14.** Piyanat Arphorn,  
Where I Was No. 1



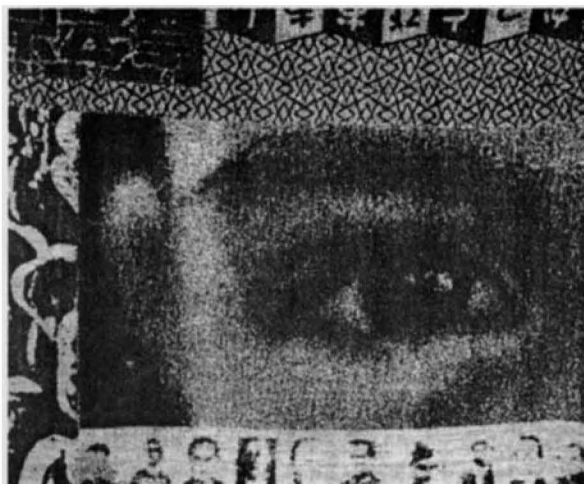
**Figure 15.** Piyanat Arphorn,  
Where I Am No. 2



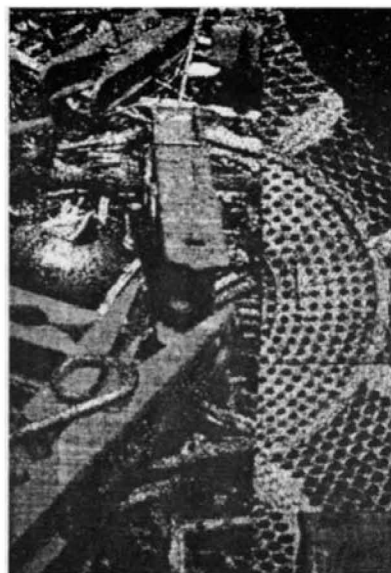
**Figure 16.** Piyanat Arphorn,  
Where I was No. 5



**Figure 17.** Piyanat Arphorn,  
Where I Am No. 5



**Figure 18.** Ann Heintz, Secrets and Symbols

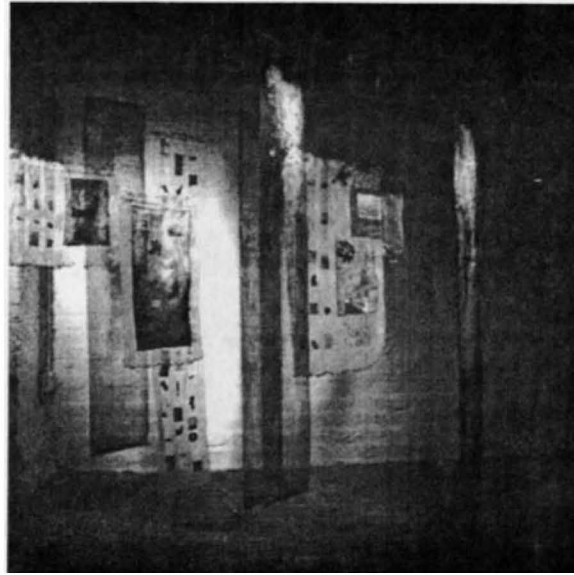


**Figure 19.** Ann Heintz, Secrets and Symbols





**Figure 20.** Ann Heintz  
Secrets and Symbols



**Figure 21.** Ann Heintz, Importance of Place