

# Neglected Values: Teaching Textile Tectonics Using Non-Western Design Precedents

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## INTRODUCTION

A new design course, entitled *Textile Tectonics*, has been conceived to promote the use of fibers and textiles from an explicitly multi-disciplinary perspective in the undergraduate architecture design studio. The course uses techniques from the tradition of arts and crafts, the discipline of fine art, and the fashion industry to supplement design problems relating to industrial design, architecture, and structural engineering. Furthermore, the course deliberately introduces design precedents drawn from non-Western sources in order to expand the avenues of design exploration for each project.

This discussion examines the often-neglected value of fiber and fabric projects in architectural education; the cultural nuances of non-western design precedents; and the utility of conventional — but seldom used — tools and techniques for academic design projects.

## VALUING NEGLECTED DESIGN PRECEDENTS

Instructors who rely upon commonly accepted views of historical context for design pedagogy when teaching non-traditional students are compelled to consider alternative approaches to design pedagogy itself.

Teaching undergraduate architecture and environmental design to a student body that is 95% African American affords one an acute awareness of how remote the conventional foundation curriculum can seem for designers-in-training that fit this demographic. Examples of sub-Saharan African ar-

chitecture have scant presence among precedents promoted by History/Theory classes, which typically emphasize the Greco-Roman, Beaux-Arts, and the Modern movements. The majority of textbooks produced for the beginning design student tend to limit their focus to Western Europe, parts of northern Africa, and certain specific sections of Asia. The majority of African architecture has had little impact on the dominant paradigm of the profession—that being the Greco-Roman, Beaux-Arts Academy and the International Style of the early- to mid-20<sup>th</sup> century. The roiling academic discourse about how to categorize the history of the African continent — Pan-African versus Romantic Hellenism versus Euro-Asian, not to mention the impact of colonialism<sup>1</sup>—makes for uneven documentation of suitable African architectural design precedents.

Meanwhile, some of the most acclaimed artists of the past century regularly and copiously used African artifacts to inform the composition, color, construction, and even content of their art pieces. Since the beginning of the 20<sup>th</sup> century, the design world has borrowed liberally from the aesthetic culture of the African continent. The European haute couture industry habitually uses African silhouettes, patterns, and textures in their clothing design collections; world renowned fine artists give credit to the traditional arts of the African continent for their masterpieces; and, in an example that is tangential to the focus of this topic, some of the most famous pop and rock-n-roll recording artists co-opted the African American music of the Mississippi Delta region, amassing great fortunes while the original artists carried on in relative obscurity.

Acknowledging, imparting, and simply reminding students that their cultural heritage has been the inspiration for many of the world's greatest designers and artists is one of the first steps in this pedagogical approach. For the students who do not fit the demographic, learning of these particular origins for a large body of contemporary culture's most famous artworks provides more options for precedent exploration in their academic projects. Furthermore, many of the African and African American design precedents lend themselves to the projects proposed for this course as will be explored subsequently in this paper

### VALUING NEGLECTED TECHNIQUES

Anecdotally, an informal survey of my design students enrolled at the HBCU (Historically Black College/University) where I teach indicates that a relatively high number are experienced at hand stitching and machine sewing. The reasons for this phenomenon are beyond the scope of this paper; however, it was this casual observation that triggered an effort to increase assignment options for design exploration and expression within an undergraduate studio course. The content of these design projects is composed, organized and sequenced to facilitate the transition into the architectural studio culture by presenting an increased number of new and unconventional academic projects that utilize tools and techniques more familiar and less intimidating to beginning design students than commonly-used design pedagogy methods such as drafting, study model building, and sketching and diagramming.

*Textile Tectonics* studio course includes recent scholarship on and about African and African American design so that students become familiar with and then use this knowledge to inform not only the surface and silhouette of their projects, but also the form, space, and structure of their designs. Additionally information about recent fashion-manufacturing innovations complements extensive technical instruction about new uses of textiles and fabrics in environmental design. Throughout class-time, techniques for working with textiles is introduced systematically, affording each student a repertoire of manual and digital skills suitable both for practical work and for theoretical explorations in any of the design disciplines.

Design education is highly compartmentalized. Architectural education typically presents information about materials within a hierarchical framework, giving emphasis to structural systems and then to finishes which derive from common professional practice: masonry, wood, and metals. Alternatively, education for Interior Design often promotes materials for their haptic qualities, including touch, acoustics, and even smell. Fashion Design lessons about materials that are intended for the fabrication of clothing may be significantly influenced by those materials' socially determined, iconographic connotation. In all cases, discipline-based teaching may undermine students' familiarity with new, innovative materials and methods, since the nature of their innovation can easily lie outside generally accepted, discipline-based practices.

In the course *Textile Tectonics* information about recent fashion- and furniture-manufacturing innovations complements extensive technical instruction about new uses of fibers and fabrics in environmental design. Throughout class-time, techniques for working with textiles are introduced systematically and sequentially, affording each student a repertoire of manual skills suitable both for practical work and for theoretical explorations in any of the design disciplines. In addition, manual design exploration—including materials creation and manipulation—allows the student to delve beyond computer-aided designs' programmatic limitations as will be demonstrated in the following project descriptions.

### TEXTILE TECTONICS: STUDIO PROJECTS

#### Project #1: Recycled-Materials Wall Covering

Wall coverings and quilts and rugs are readily understandable objects for beginning students. They are not only decorative elements as they also provide shelter from thermal fluctuations; they regulate interior temperatures; and they provide a barrier from insects and dirt when used as either interior or exterior rugs. The renowned African American Gee's Bend quilts provide examples of African American artisans utilizing African, European American, and African American design precedents. "These strikingly beautiful quilts from an isolated Alabama town just might deserve a place among the great works of twentieth-century abstract art."<sup>2</sup> These quilters used "...established,

shared, and locally tested [design] templates.”<sup>3</sup>

Relatively standard methods of assembly and readily available materials are used to produce this initial project, which is a wall covering made from found items and recycled stuff. The assignment emphasis requires insulating, water-repelling, and shading properties of each fabrication. It is a beginner’s introduction to wall construction systems. This requires each method of joinery to be carefully considered so that the integrity of the textile is not compromised, as a stitched seam creates a puncture in the material, as overlapped materials can serve as conduits for moisture, just as with membranes commonly used by the construction industry. Manipulation of the wall covering’s materials with heat, moisture, and pressure can produce unexpected results even when conventional assembly techniques are used.

In combining the fields of fine arts and crafts with architecture, this initial studio project presents an opportunity to explore composite technology and performance characteristics of fiber combinations and textile material applications.

### **Project #2: Fractal Ottoman**

“Fractals can be seen in many of the swirling patterns produced by computer graphics, and ...[their] patterns are surprisingly common in traditional African designs...”<sup>4</sup> Project #2, the “Fractal Ottoman”, uses conventional two-dimensional flat pattern-making techniques and iterative geometry—that is, fractals—to create small furniture pieces: beanbag ottomans and cushions. It introduces beginners to the sewing machine and to computer-aided design drawing. This assignment emphasizes craftsmanship and functionality in addition to desirable aesthetics, the value of which become even greater when combined with the emphasis on the tradition of fractals that permeates the cultures of the entire continent of Africa. After mathematically calculating the dimensions of the project, students manually produce the flat-pattern by drafting measured pieces on paper film. Once complete, the pattern piece can be re-drafted using line drawing techniques in any computer-aided design program and, with one simple command, the pattern piece is duplicated in an array. The next step is to arrange the paper flat-pattern on a piece of fabric using the minimal amount of the material, an invaluable les-

son on economy of means. All that remains at this stage is for the cushion to be assembled by sewing the fabric sections together with the sewing machine and then stuffing the assembly with filling to create the three-dimensional cushion. Craftsmanship and time management are emphasized during the concluding portion of the assignment.

### **Project #3: Sparterie Shelter**

Project #3 uses couture millinery techniques to create organic, three-dimensional forms utilizing many of the same tools that three-dimensional CAD programs use to create forms for the designs of buildings. Inexpensive materials are utilized: woven-mesh fabric coated with stiffener, flexible paper-coated wire, and needle and thread. As the students work with paper patterns they are encouraged to let their imaginations experiment with a wide range of shapes and compositions. This assignment begins with three-dimensional exploration, which then must be converted to a two-dimensional pattern, which is then constructed into a textile frame in the third dimension. Cutting, sculpting, tracing, drafting, stitching, and assembly techniques are all applied to complete this assignment. The resulting frame, or *sparterie*, can be manipulated further to fine-tune the designer’s intent. The technique permits students to produce fantastical shapes as they complete this assignment. Typically, a healthy competition springs up... waiting to see who can produce the most “far out” design. Anecdotal studio experience has revealed that the students’ emotional investment and physical attachment to their *sparterie* models is greater than when they produce similar designs digitally with computer-aided design programs.

### **VALUING NEGLECTED MEDIUMS: FIBER AND FABRIC**

Of special interest in the *Textile Tectonics* studio is work that stretches the potential limits of fiber and conventional expectations of the form and function of textile structures so that challenging and innovative proposals can be explored. “The astonishing new technology in contemporary textiles is narrowing the gap between the worlds of art, design, engineering and science.”<sup>5</sup> Design and implementation of composite textile technology requires specific knowledge and expertise and drives progressive design practices in today’s global economy. Those

designers who have the experience, sensibility, and technical know-how to work with membranes and fabrics have a significant impact upon all the design disciplines, including architecture, civil engineering, aerospace, interiors and fashion.

Studio projects that are based on assembly methods of textiles focus attention on material research and development. Using a familiar materials—fibers and fabric—new applications of architectural form and space are explored that expand the potential material uses, emphasizing decorative, structural, acoustic, and thermal properties. The academic research, conducted in a studio lab environment, includes the development of full-scale design projects that integrate manufacturing, couture hand stitching, fusing, knotting, draping, coating, and sculpting fabric into the tectonic to achieve freestanding material configurations.

Even though hand sewing has become “anachronistic in today’s society...”<sup>6</sup> acquiring skills that foster conceptual and critical thinking provides designers-in-training with yet another method of contributing to the development of new construction materials and methods. The fashion critic, Cathy Horyn, states that “...for farsighted designers the real hurdle to progress... is creating a fabric that can produce a new, 21st-century silhouette.”<sup>7</sup> Similarly, in the construction industry, attaining a new level of performance-oriented design, organized around key characteristics of textiles such as ‘pliability’, ‘structure’ and ‘fibrosity’ provides another approach to developing textile technologies.

## ENDNOTES

- 1 Nnamdi Elleh, *African Architecture: Evolution and Transformation*, (New York: McGraw-Hill, 1997).
- 2 Mark Stevens, “Quilts of Personality,” *New York Magazine*, December 23, 2002.
- 3 William Arnett, *Gee’s Bend: The Architecture of the Quilt*, (Atlanta, GA: Tinwood Books, 2006).
- 4 Ron Eglash, *African Fractals*, (Piscataway, NJ: Rutgers University Press, 1999).
- 5 Sarah E. Braddock and Marie O’Mahony, *Techno Textiles*, (New York: Thames & Hudson, 1998).
- 6 Andrew Bolton, *The Supermodern Wardrobe*, (London: V&A Publications, 2002).
- 7 Cathy Horyn, General Lee, accessed September 11, 2009, [http://www.nytimes.com/2009/09/13/t-magazine/mens-fashion/13mcqueen.html?\\_r=1&adxnnl=1&adxnnlx=1265850573-XLTyIiuOh+EvGeor+qwFGA](http://www.nytimes.com/2009/09/13/t-magazine/mens-fashion/13mcqueen.html?_r=1&adxnnl=1&adxnnlx=1265850573-XLTyIiuOh+EvGeor+qwFGA) (accessed September 11 2009).

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