

NO. 2

THE BUSINESS OF CRAFT

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*The creative hurdles and triumphs of the independent fabricator*photography
Jack Thompson

Though many architects and designers are largely disconnected physically from the fabrication of their work, several Houston designers show how to bridge that divide by using the process of making things as a tool to improve their creations. The following profiles highlight a few of these individuals who have forged their own role in the process of fabricating their designs.

► Chloe Dao ◀

If architecture lies at the more complicated and fragmented end of the design production spectrum, the other simpler and more cohesive end starts with the use of a needle, thread, and cloth. Fashion is a rare discipline where the designer can have ultimate control over what they produce, and the fashion designer provides a clearly delineated model for how to achieve that control. In Houston a prime example of that

model is Chloe Dao. Since winning the second season of Bravo's *Project Runway*, Dao has developed a business where she decides exactly what she produces. Engaging in what she describes as "an old craft," she makes virtually every item of clothing by hand. Her designs are dependent on her understanding of how fabrics will drape, which seams will allow the clothes to achieve the proper shape and still accommodate the movement of the body, and how different materials will stand up to daily use and washing.

Yet even in this most traditional of industries, technology has become essential to her business. For example, after Dao has worked out an initial design in a fit model—first in muslin, then in production fabric—she scans in the garment pattern on a digitizer and uses a program to grade it for all of the final sizes. She then prints patterns out for each size, which allows her to cut the fabric and begin producing a collection almost immediately. Much of what she needs to produce her line is available in Houston. Though most of her fabric comes from New York, she has been surprised by how much is available to her here. One of her students at Houston Community College referred her to

a friend who does custom silk screening for printed fabric. And when Dao needed to have some custom hardware made, she found a jewelry designer in Houston who could make the needed clasps, buttons, and snaps after posting to her Facebook page.

With the nearly total control she has over her business, Dao still faces issues that are familiar to most small-scale designers attempting to push the edges of the creative envelope. Although she would like to experiment with different materials, she always has to think of how the fabric will breathe and how it can be cleaned. She has ideas on how to integrate technology with traditional craft—combining 3-D printing, laser-cut fabrics, and larger-scale jewelry elements to create sculptural objects as clothing—but the more traditional wearable lines take precedence when it comes to time and money. She is able to create garments that are approachably elegant in form at first glance, but demonstrate detailing that is sophisticated and engaging upon closer inspection. In the end, it is a business like any other: she must constantly think of how to design what she loves and still make enough money to sustain it and herself.



Chloe Dao personally fabricates items in her lines of clothing before using computer modeling to develop a range of sizes.

► Wac ◀

Scott Cartwright and Jenny Lynn Weitz-Amaré Cartwright founded wacdesignstudio in 2009 in Houston. Their story illustrates how the advantages of this city are often economic and personal. They met while attending the School of the Museum of Fine Arts Boston. Though they both studied art, they were more interested in how art related to design, and they began by making furniture in their small apartment in Boston. But working in the city posed a problem: they could only work on projects at certain times of the day

to avoid disturbing their neighbors in their high-density neighborhood, and the high cost of renting space prevented them from moving their furniture-making to a studio.

Houston provides them with opportunities that they didn't have in Boston: access to the woodworking shop of Scott's family, who owns a cabinetry business in The Woodlands, gives them capabilities (including scrap material) they wouldn't otherwise have, and affordable studio space allows them to make things without disturbing neighbors. What is more, day jobs provide them with an income stream to sustain themselves.

After acquiring a studio in David

Adickes's warehouse building, they have used models, sketches, and CAD drawings to develop their designs and determine how to build their pieces. At nights and on weekends, they drive up to the family woodworking shop in The Woodlands to produce their pieces after hours, using scraps and leftover components from the shop. Though they do not have access to more technologically advanced equipment, such as multi-axis CNC routers, the modest but well-equipped facility lets them use machines they wouldn't otherwise. With edge banders, saws, drills, joiners, and vacuum formers—even a large finishing booth—they have the means to produce well-crafted pieces. Given these capabilities, they are only limited by the amount of time they have to spare. For that reason, when they go to the shop, they make sure to have everything already planned out so they can spend as much time as possible making furniture. They already have figured out exactly what jigs and forms to make, what materials they will use, and how long it will take them to finish. And they must ready the shop for its regular business on Monday morning as if they were never there.

Though they plan out their entire weekend's production, the act of fabrication often becomes a learning process. Once, when a formwork broke while a bent plywood lounge was hardening, they realized they preferred the unexpected results. Each time they produce something, they find a simpler way of doing it or they adjust their designs for more refined results. And each new experience in production gives them a better understanding of how to continually improve their ultimate designs.

As they look ahead to the future, they want to grow their practice only to the point that it sustains them full-time. They value the idea that work like theirs has a perceived value because of its rarity. However, unlike Chloe Dao, who has adopted the more clearly established model of a fashion house—where a designer has an atelier where she can design and produce work and a retail outlet to sell that work—these designers must formulate their own independent position in the production of their design. They have no clearly delineated path to follow to achieve their goals. And that looming question may prove a greater challenge to solve than actually producing new work.



On weekend nights, Scott Cartwright and Jenny Lynn Weitz-Amaré Cartwright work on molded plywood furniture in the finishing room of a cabinetry company in The Woodlands.



The duo designs primarily in plywood combining bent and planar forms, a logical consequence of available material and equipment.



Melissa Borrell in her Houston studio.

► Melissa Borrell ◀

The delicate and graceful nature of Melissa Borrell's designs are paradoxically rooted in heavy industry, not fine hand crafting.

Upon completing a graduate program in jewelry and metalsmithing at the Rhode Island School of Design, Borrell realized that she was more interested in the industrial processes that weren't part of her formal education. Producing thousands of the same design interested her much more than producing everything by hand. For her, exploring and selecting the appropriate manufacturing process for a particular design is a rewarding endeavor.

The design she is probably best known for is her metal Pop-Out jewelry series. Though the fabrication is not done locally, the process and product express the city's industry. Roughly the size of a credit card when purchased, the piece of jewelry must be detached from the surrounding metal "card" to be completed. Borrell initially tried laser-cutting the metal to produce the series. After doing more research, however, she found that photochem-

ical etching—the same process used to make computer chips—worked better: acid etching allows for both partial inscribing and complete cutting through the material. The same process that allows her to make the detachable jewelry element also allows her to inscribe labels onto the original metal "card," so the package and the jewelry can be one and the same.

As she produced more designs, Borrell branched out beyond jewelry to apply her understanding of manufacturing to a wide variety of objects. For example, by directly etching the glass surface of clear incandescent light bulbs—a process she learned on another project—she creates a lamp whose light source and shade are a single object. She discovered a man in Houston who makes ceramic molds and commissioned him to produce some of her vase designs. She has even found a company that can print on window shade material, leading to another series of products.

As with any emerging designer, she hopes to support herself with her designs but has finite resources to expand. She eventually left Houston for Austin, where she now does most of her design work—which involves both paper sketching and computer programs—out of

a Borrell's Pop-Out jewelry series is made using photochemical etching.

b A "tree trace" for a window shade.



her home. Most of her resources go toward actual production costs. But to jump to the next level in her career, she realizes she must decide how to carefully parcel out those finite resources. She would like to create larger planters based on her vase designs, but the investment in money, time, storage space, and marketing poses serious risks when she is not certain how well the planters will sell.

Getting things made can be tricky. Selling is even trickier. She spends as much, if not more, time managing the process than she does actually designing. Although she has an extensive portfolio that reflects a broad understanding of production, she wonders what more she can do with that knowledge and has started to reassess where she fits into the design industry. In particular, she is investigating how she can use her resources for interior design projects. She could become a consultant who advises interior designers, or she could attempt to produce architectural products for interiors and assume the associated liability and warranty issues.

If her past work is any indication, she will continue to succeed, whether as a consultant or entrepreneur, in producing innovative products that highlight process.

► David Tsai ◀

Like Borrell, David Tsai works in a variety of materials and utilizes several different manufacturing processes. But with a practice that was geared toward industrial design from the outset, he has focused more on creating functional objects than designing aesthetic pieces like jewelry.

After an undergraduate degree in architecture from the University of Texas and graduate studies at the Rhode Island School of Design and Cranbrook Academy, Tsai opened his own design studio. Until recently, he balanced his design practice with teaching as a visiting professor of industrial design at the University of Houston.

Most people think of manufacturing as a fairly rudimentary process: materials go in one end and the finished product comes out the other, exactly as designed. But for Tsai the reality is quite different. For his initial mockups, he moves back and forth between creating physical models using very basic materials, such as cardboard, paper, plaster, and foam, and working out the design with software programs. Once he is comfortable with the development of the mockup, he then looks for the best method of manufacturing and the best place to outsource the production of the prototypes. That's when the process becomes more challenging.

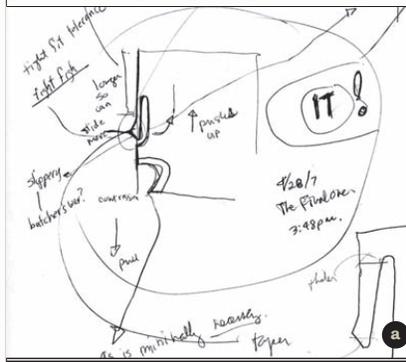
There can be a big difference between the virtual computer model and the actual production piece. Manufacturing requires as much knowledge, skill, and understanding as any craft, and a skilled manufacturer can compensate for the variations caused by the motion of production equipment or the deflection of materials caused by gravity. Finding these experienced craftsmen, however, can be challenging. Although it may only cost \$200 to \$300 to get a prototype made, it becomes a more expensive proposition when you spend that amount several times over before finding a fabricator that can meet expectations. Working in Houston has the advantages of its large industrial base, but most manufacturers here are used to working with oil and gas companies, who are more interested in functional considerations than issues like fit and finish.

Yet production difficulties, Tsai says, pale in comparison to the business realities of selling his products. As a designer, he understands how to take a product from a conceptual idea to a real object. Both his education and his working experience have prepared him to resolve those types of issues. However, no one has a road map for

launching a product that is certain to be commercially successful. Deciding which pieces to produce isn't always obvious, and the motivation of a manufacturer to produce a certain item or a retailer to sell it isn't necessarily apparent. In the end, balancing a conceptually beautiful design with one that will sell is never easy.

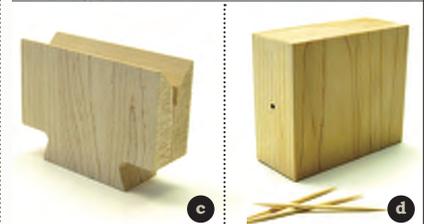
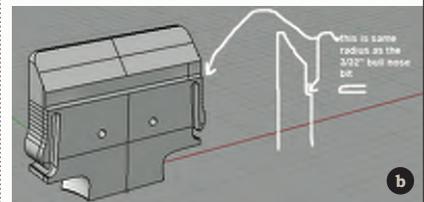
Tsai feels that the only way to resolve sales issues is to tackle them head-on. Looking at other successful designers, he has decided that you should have an almost blind faith in yourself; you can't rely on others for it. If design is, as he believes, something that teaches you how to learn, then learning

the best way to achieve commercial success should be no different. He has decided to test this hypothesis by taking one of his products—a wooden toothpick dispenser called Tree Chunk—and working to make it commercially successful. He has had a company in Houston produce 150 Tree Chunks and is now figuring out how to sell them. He hopes that learning how to sell one design will teach him something about how to sell the next. Ultimately, knowing how to get his designs into the hands of the general public will become just as valuable to him as knowing how to make them in the first place.



TREE CHUNK - A TOOTHPICK DISPENSER

a Pencil sketch. **b** CAD drawing. **c** Wood mockup. **d** Final product.



David Tsai works at a station of his own design.



Michael DeBakey sewed the first dacron graft for cardiovascular bypass surgery in Houston on his wife's sewing machine.

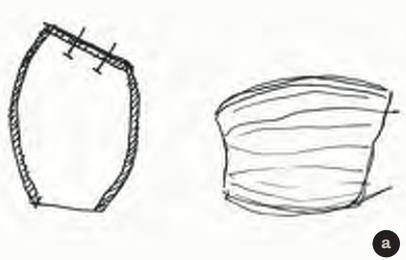
► Plodes Studio ◀

John Paul Plauché took the big leap this year. At a time when many designers are desperately looking for employment, he left a position at Kirksey Architecture and now works out of a two-car garage at his home in Baytown.

Plauché opened Plodes Studio in 2003 as a side project. He first gained recognition as an independent designer with his Barnacle storage unit when it appeared in 2004 as part of *Metropolis* magazine's first ever Next Generation Design Competition. Over time, he has developed a series of products, ranging from items as small as drinking glasses to those as large as outdoor furniture, produced as a collection in a series of different materials.

Plauché is devoting most of his time now to his own design practice. He usually starts with a form and then experiments with prototypes to determine which materials and production methods are most appropriate, looking for ways to simplify the final number of process steps. In some instances, he actually works backward from how an object might be ultimately manufactured and tailors the design to make production easier. Once he is satisfied with the prototype, he then looks for companies in Houston that can manufacture his product. Each new design increases his understanding of how things are made.

Limited resources, the cost of materials and manufacturing, and the need to sell things to consumers largely dictate what Plauché ultimately produces. For example, when he started developing his Waveform shelf, he rejected the original material—ABS



BARNACLE - STORAGE UNITS

a Pencil sketch. b Unfolding surface technique from computer model yields a rough chipboard model. c A wood model or pattern was used to create a fiberglass mold, in turn used to create d The final product.

thermoplastic—for cost reasons and opted instead to make it out of powder-coated sheet metal, a less expensive material, though the two-step process required more of his time to manage. He decided that given the unknown market for the shelf, it was wiser to invest his time, rather than his money, in its production.

Quality, he discovered, is much more difficult to control when others are manufacturing your object. In producing the prototype for his Float outdoor furniture collec-

tion, he originally coated the foam structure in a hard plastic shell. But when he received the final production sample the day before he was to leave for the International Contemporary Furniture Fair in New York to exhibit his work, it did not meet his expectations. He later found another plastic that was more durable and provided a more consistent finish.

In another example, he originally intended to manufacture his double-shelled Drooplet glasses using a Houston company that makes custom Pyrex pieces, but later decided to use a Chinese company for the production run. Unfortunately, the company produced the glasses, originally designed as a single piece, out of two glass pieces fused together, and when Plauché received his production shipment, half of the glasses were either broken or had sharp edges where the two pieces were fused together.

His prior experience with fabrication has benefited him beyond ensuring quality. When the contractors he dealt with at Kirksey told him something couldn't be made, he felt comfortable challenging them. Moreover, his knowledge of how things are made has allowed him to start an online shop called Re Mod to sell the vintage furniture he restores. Restoring salvaged pieces also gives him further insight into how objects are put together which helps him with his own work. Ultimately, his hopes for Plodes and Re Mod are tied to a desire to create a stronger local culture that values good design.



Plauché considers the space for a gallery at 4411 Montrose.

Andrew Vrana and Joe Meppelink are the principals of Metalab, which specializes in digital design and fabrication from concept to construction.



virtual model of it and peeled away the different sections as if it had digital bark. By methodically determining the series of perforations needed for each section of bark, they created digital templates that a manufacturer could use to cut sheets of metal, bringing the virtual bark into the real world. This pre-manufacturing of large sections minimizes on-site labor and machinery. Two people could then bend each section by hand and assemble the tree as if it were a simple kit of parts. Installation took no more than a couple of hours.

This digital fabrication process, however, runs afoul of standard insurance practices. A fabricator is usually required to interpret the design intent of the architect

► Metalab ◀

The promise of closing the divide between design and fabrication is a challenge for small-scale fashion, furniture, and jewelry designers, but architects may have the most to gain and the most difficult time doing it.

While still a student at the Rice School of Architecture, Joe Meppelink opened the first incarnation of Metalab as a metal shop after a professor commissioned him to produce a handrail. The business eventually grew to ten employees working out of a 10,000-square-foot facility where digital technology was an essential part of the fabrication process. Ultimately, he sold the shop and returned to a more conventional architecture practice. After teaching at the University of Houston though, Meppelink joined with colleague Andrew Vrana, an architect with extensive experience both in advanced computational and digital fabrication and in carpentry, to reform Metalab as an architectural practice that integrates digital fabrication directly.

Meppelink and Vrana actively seek to build relationships with different fabricators in Houston. When Meppelink first used Campo Sheet Metal, an established fabricator with a history of producing industrial equipment, to produce some elements for his

original metal shop, the company had never worked on architectural projects before. Each successive project thus strengthens the architects' ties to fabricators or leads them to forge relations with new companies that push them even further out of their comfort zone.

This understanding of, and connection with, materials and techniques is not always well received. Many times architects and contractors see customization as being cost prohibitive—leading to what Meppelink calls “fear-based pricing.” So Metalab has opted to work on projects where customization is seen as a positive or where custom fabrication is actually expected. Only ten percent of their work is architectural in nature; 30 percent of their commissions are for industrial designs, while nearly 60 percent of their practice involves working with artists to implement civic art projects, such as New York sculptor Matthew Geller’s Open Channel Flow sculpture on Buffalo Bayou.

When Geller approached Metalab for help in fabricating a piece called *Woozy Blossom*, the artist’s concept was to create a full-scale misting tree out of metal. After digitally tracing the artist’s tree concept, the designers created a

and produce shop drawings indicating how a component will be built. The architect approves or rejects those shop drawings based on how closely the manufacturer has interpreted the original intent. Metalab circumvents the shop drawing process altogether. The designers are, in fact, telling the fabricator how to make something, not the other way around. Meppelink and Vrana have had to explore liability arrangements whereby they are contracted to the client directly for design services, but also subcontracted as a consultant to the fabricator who has the necessary insurance to actually make the component. By working to push the edges of how an architect designs, Metalab also pushes the boundaries of what role an architect plays in the construction process as a whole. By assuming more responsibility in the fabrication process, the two partners show architects how to retake ground they have lost in the profession and to create new opportunities that allow designers to more directly have an impact on their surrounding world. ☺



Four windfarm lookouts for Horizon Wind Energy were designed through a collaboration of Metalab and tweak.