IMAGINATION MADE TANGIBLE

Computer rendering and laser-cut acrylic model of a Bradley Beach home designed by Richard Garber's firm, GRO (Garber Robertson Office), were selected for exhibition at the 2004 ACADIA Conference, "FABRICATION." These explored how special software and cutting hardware are changing architecture.

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ASPIRING DESIGNERS ARE NO LONGER LIMITED to two-dimensional expressions of their ideas on paper or on computer screens at New Jersey School of Architecture. With the opening of the FABLAB — convenient shorthand for Fabrication Laboratory — students can now translate their designs into precise 3-D prototypes, parts, or models. The fabrication process allows them to study and evaluate their design concepts with a greater degree of control over the implementation of their ideas than previously possible.

"For the first time, architectural designers are enjoying the opportunity to integrate their work more closely with the construction industry," says Richard Garber, assistant professor of architecture. Under Garber's direction, the FABLAB provides a range of hardware that is computer numerically controlled (CNC) — laser cutters for acrylic and heavy paper, 3-D printers that build objects from layers of plaster, and a CNC router that can mill such materials as wood, foam and metals. Working in concert with special 3-D design software, the machines translate students' concepts into three-dimensional prototypes or models.

"Our CNC tools have the ability to convert digital data into physical 3-D components that can be used to estimate and evaluate design intentions," Garber says. "Physical constructs allow the designer to estimate the large-scale effects of a master plan more readily, as well as to evaluate smaller-scale assemblies such as furniture, signage and enclosures."

The FABLAB tools are equally applicable in

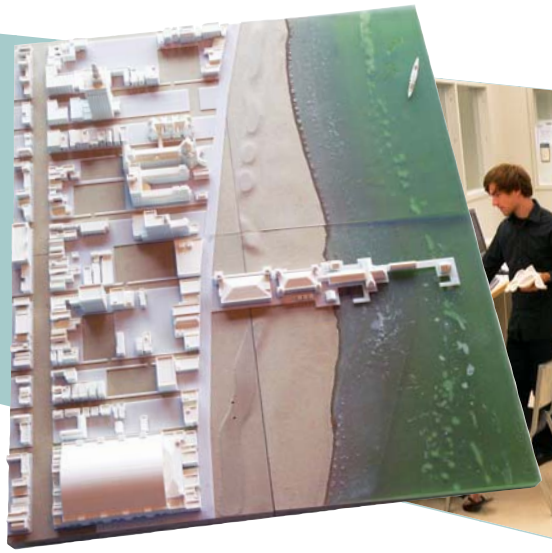
architectural design and the development and manufacture of new products. The FABLAB will also support the school's planned degree program in industrial design, which will focus on teaching students to track products from concept and design through manufacturing and everyday use. Rapid prototyping of products or parts ranging from office furniture to medical devices will be a basic part of the program.

"The FABLAB is the manufacturing bridge between the worlds of architecture and industrial design, making it much easier for students to study physical form and materiality as an extension of their digital work," Garber says. It all comes together in his Robustness Studio, where students get hands-on experience with the equipment while addressing such design challenges as flood-resistant housing or an improved salt shaker.

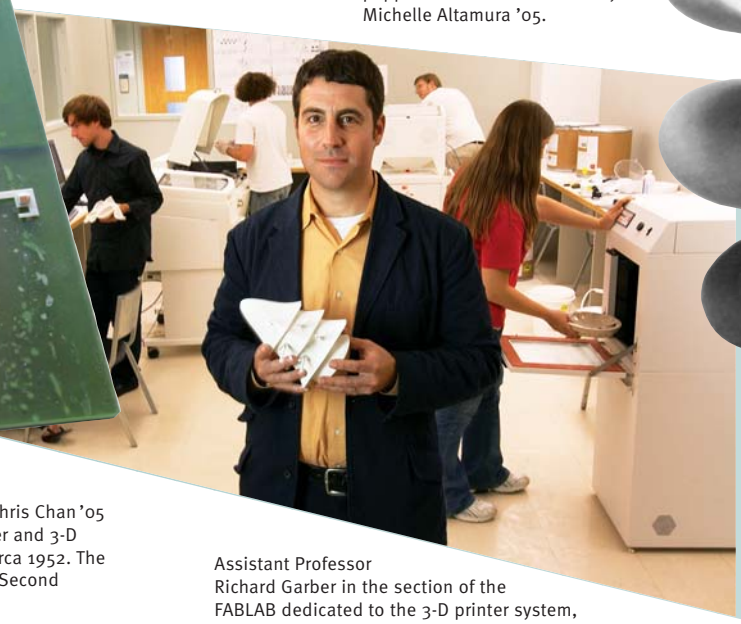
"What students learn in the studio and the FABLAB can be applied to their work in architecture, in industrial design, or both," Garber says. "Take Michael Graves, for example. He was already established as a leading architect when he expanded his design skill to products such as teakettles for Target stores."

The bachelor's in industrial design will be a four-year program emphasizing innovative solutions to real-life technical and economic needs. The program builds on the School of Architecture's preeminence in computer-aided design (CAD) and expands that expertise to include computer-aided manufacturing (CAM).

Garber explains that an emphasis on design is one way to reinvigorate manufacturing and challenge traditional construction practices in New Jersey. "Globalization of the marketplace and outsourcing have created an extremely competitive environment in building and manufacturing. Products must therefore distinguish themselves through both technological innovation and superior design," he says. "Design has become the chief characteristic that defines a breakthrough product." ■



Garber and students John Murphey and Chris Chan '05 used the FABLAB's laser cutter, CNC router and 3-D printer to build a model of Atlantic City circa 1952. The model was exhibited in Rotterdam at the Second International Architecture Biennale.



Assistant Professor Richard Garber in the section of the FABLAB dedicated to the 3-D printer system, whose main fabrication unit can be seen at the back of the area on the left. Garber is holding a model of a modular storm-resistant housing unit designed by John Murphey '05 and made with the printer. Murphey's concept is a "command pod" that can be quickly deployed to shelter researchers and first responders in areas experiencing severe environmental conditions.

Students in the Robustness Studio also have the opportunity to apply imagination to the redesign of everyday objects. Right, salt and pepper shakers reconceived by Michelle Altamura '05.

PORTRAIT PHOTO: PETER VIDOR