Collaborative Craft: An Interdisciplinary Ceramics and Architecture Studio

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Given the ubiquitous nature of digital fabrication technologies in architecture programs today, educators are seeking ways to move beyond fetishistic use of the tools to consider deeper logics: material efficiency, combinatorial processes and the implications of digital and hand craft in making. In an effort to teach fabrication tools within a framework of one-to-one scale prototyping and molding, the co-authors co-taught (along with David MacDonald) a studio collaboration between second year architecture students and ceramics majors. The teams worked together to develop the design and prototypes for affective, water-shedding surfaces for a studio project that the architecture students were developing concurrently, a Chocolate Factory.

The collaboration was a rewarding experience on many levels. Firstly, and perhaps most importantly, the architecture students learned that the disciplinary vocabulary they had developed in just a year and a half of their education was not sufficient for communicating with the ceramics majors. The architecture students needed to describe their vision for the tiles without knowing all the technical aspects of the tile making process. It took numerous meetings both inside and outside the studio time for the interdisciplinary partners to arrive at an understanding about what they would make and how. Secondly, architecture students gained a much deeper understanding of the processes involved in developing customized ceramic surfaces, gaining hands-on knowledge about crafting plaster molds for slip casting tile-multiples. Knowledge of manufacturing was fortified through a factory tour at Boston Valley Terra Cotta. Similarly, the ceramic students, though exposed to digital technologies through discussions, garnered valuable insight into the processes involved in CNC milling and 3d printing, equipment that is not currently available in the Department of Art.

The products that the collaborations produced were generally conservative, and not all students were able to take full advantage of all the tools that were being offered. Furthermore, and hopefully this will be addressed in the next iteration of the collaboration, the projects did not address all of the performance goals that were originally established. Additionally, we learned that a collaborative studio requires more than the month we had allotted, especially when working with a "slow" material such as fired clay.

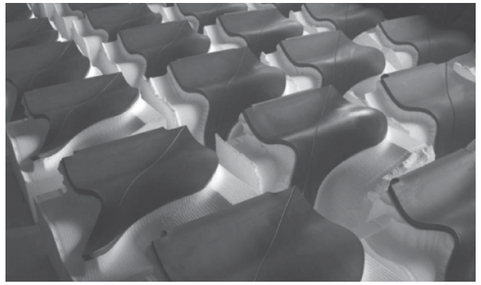
Despite the timid quality of some of the project outcomes, the students were incredibly eager and learned a great deal. A few of the architecture students went on to take a ceramics independent study, and similarly, a few of the ceramics majors are forging into the realm of computer modeling and fabrication in their thesis work. The collaboration inspired a new 3D modeling course in the Ceramics department, which is being taught this semester by graduate student, Joel Weissman, who was a participant in the collaborative course.

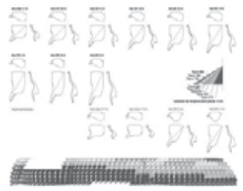
Louis Sullivan, Wainright Building detail, St. Louis, MO 1891, Enric Ruiz, Cloud 9, Villa Nurbs, milled molds for ceramic, 2010, Enric Ruiz with Frederic Amat + Toni Cumella, Villa Nurbs, 2010

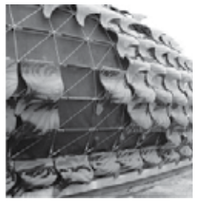
Research Questions
How can the digital fabrication expertise of architecture students and the craft knowledge of art students be combined to create facade tile prototypes?

How can designers conceptualize ceramic within the contemporary context of ornament and performance? With new technologies, is it possible to achieve new forms and effects with this ancient material?

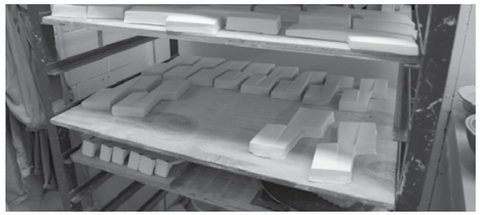
Can students majoring in ceramics and architecture develop vocabulary and techniques to collaborate on the design and making of affective architectural tiles?







Materials and Methods
In order to develop affective and precise tile modules, the architecture students developed their designs in Rhinoceros and some created digitally fabricated molds using the CNC router and vacuum former in order to cast the plaster negatives, which facilitated the production of tile multiples. Future iterations of the course will harness the ability of the slip cast to generate intricate details, so rapid prototyping will be utilized to create complex forms for ornamental and performative effects.



Discussion

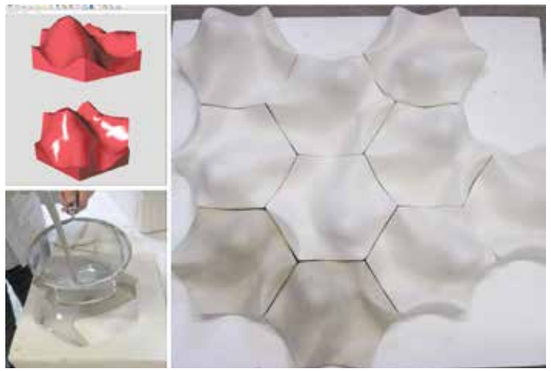
Architects working within the realm of the new--either in terms of form or material--realize concepts through research, experimentation and collaboration. While teaching at Syracuse University, the authors co-taught a course collaboration between architecture students and ceramics students that sought to encourage innovative material explorations by combining techniques borrowed from each of the disciplines: digital fabrication machines, which are widely utilized in architecture programs to create both scaled models and full-scale installations; and hand-crafted slip-cast molds, which have been used in ceramics processes for hundreds of years.

This was a challenging, but highly rewarding pedagogical experience. Many of the architecture students used extremely precise computer numerically controlled milling technologies to make molds for plaster casts. Technological innovations have only recently begun to transform the craft disciplines, so the ceramics students were aware of the potentials, but had not explored the technologies in their education. Similarly, the architecture students learned about the history of the use of ceramics in architecture and the tremendous potential of the durable, sustainable material in contemporary practice.

Some of the designs could have been more progressive from a formal standpoint; despite this, the work was well-received by faculty in both schools. This cross-disciplinary collaboration has incredible potential not only for learning, but to push the fields of architecture and ceramics.

Ariel Minelli with Sarah Wilson, Chocolate Factory Tile, Second Year Design Studio, Spring 2011

The context for the tile design project was a Chocolate Factory, which the architecture students were also designing. Some students created facade tiles, while others (such as those pictured above and below) focused on interior screens or tessellated skins.



Marco Piscitelli with Joel Weissman, Chocolate Factory tile project, Second Year Design Studio, Spring 2011

Jaehyun Kim with Zachary Dunn, Chocolate Factory tile project, Second Year Design Studio, Spring 2011

Future Direction

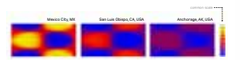
Perhaps one of the most exciting aspects of the collaborative ceramics investigations is the potential to harness the filtration properties of ceramic material in architectural applications--a prospect that has not been fully explored.

Traditionally in architecture, ceramic has been utilized for its moldability and aesthetic qualities as well as it's durability and water-shedding properties, but on an architectural scale, has not been fully explored as a water and air filter.

In the next iteration of the ceramics-architecture collaboration, the performative aspects of the material will be emphasized in the research, design and analyses.

wall programmed to non orthogonal geometry

In another materially-focused course, performative facade modules were created to mitigate heat while also harnessing daylight. Similar strategies of parametric modelling combined with Ecotect analysis will be utilized for future iterations of the ceramics-architecture collaboration.



solar analysis generated apertures