CDR, Architecture and Industrial Design Students Exhibit Technology Research at International Exposition

The binding agency of technology between architecture and industrial design students is evident through an exhibition at the 2018 International Contemporary Furniture Fair (ICFF). Fourteen students from first year design through graduate programs in the School of Architecture + Design were among the team sharing the development of individual projects organized by the theme, the Part and the Process. Led by the Center for Design Research (CDR) with support from the Autodesk BUILD Space, the work tracks the emerging influence of evolving technologies including additive manufacturing and robotics on the education and practice of design.

ICFF, held in the Jacob Javits Convention Center in New York City, is North America's premier platform for global design. The annual event challenges industry leaders and emerging talent to share their visions of “what’s best and what’s next” in the world of design. The event draws more than 35,000 visitors seeking a glimpse of the future of design.

The 2018 exhibit, the Part and the Process, builds on a long history of past CDR presentations. ICFF 2009 saw students immersed in technological articulation, developing new functional forms and assemblies through work titled Industrialized Furniture. In ICFF 2015, the research trajectory expanded with Technological Material Transformations - The Technology is in the Aesthetic, exploring the potential for digital fabrication enabling new modes of architecture, design, and education. Last year, Technology and Tradition: Explorations at the Intersection of High Tech and High Craft, presented prototypes spanning product, furniture, and architectural interventions positioning hand construction in the context of digitally fabricated work.

The Part and the Process 2018, supports graduate and undergraduate student research by providing opportunity and access to digital technology. This includes innovative designs created through the use of advanced computational work-flows and demonstrated through digitally
fabricated prototypes that employ Additive Manufacturing (3D printing), modes of reclaiming and recycling materials, and combinations of material processes including robotics.

The student work is a cross section of technological applications across curriculum and represents each stage of the pedagogy within the School of Architecture + Design. First year graduate student, Pablo Cabrera presented work relating to the use of 3D printing to analyze structural stress through visual manifestation of forces applied to cubic volumes. The experiments are a means to minimize material, maximize strength, and determine the optimal distribution of material and utilize a generative design process – topology optimization. As a counter point and in relation to traditional material systems Jason Cusak, a student in the Master of Science program presented work exploring the role of clay-based ceramics in furniture design utilizing a combination of traditional material processes and digitally fabricated molds and tooling.

From the foundation design first year program, Kaelum Hasler, a first year student in the foundation program, leveraged the international stage to introduce a unique desktop laser cutter named Optiq. The patent-pending design is a fully working prototype supported by the CDR that was used in the development of some of the objects on display. As a continuation of foundation-level work, Yibin Yang, a second-year student in architecture, utilized 3D printing as the only means to produce a prism shaped twisting ring named Mobius. As a didactic story, it engages observers in a game to find the rolling ball while delivering an insight to topology. This is part of an ongoing collaboration with the Swiss toy company Naef.
A multidisciplinary team of Kylie Quinn (third year industrial design), Julia Costa, (third year architecture), and Andrew Gibson (third year industrial design) developed techniques to 3D print fabric-like patterns with potential application in fashion and furniture. Other examples from the fourteen student team include processing and re-purposing plastic ocean waste, (Nathan Kent, John Harris), a study of Japanese joinery as 3D printed investigations (Isha Mishra), and a full-scale table base printed with a large scale robot arm (Cole Powell). First year architecture students (Gabby Ritter, Alex Munro) explored “the space of the hand” with 3D printed forms, and formwork, for casting ceramic elements. This series of studies linked with the Touching Circus, a series printed forms with varying densities studying the ergonomics of grips (Neil Slinde, industrial design).

A philosophical tenant of the School of Architecture + Design embraces the concept that situations of important learning happen between peers, and in contexts outside of the normative classroom or studio. Faculty/student interaction at such venues as ICFF provides for intellectual mentorship within the context of real time circumstances and consequences. Faculty learn from the students as they advance their educational development.

This development of work represents a snap shot of the collaboration across disciplines from the School of Architecture + Design enabled through the development of new courses in design technology and the construction of infrastructure supporting student work in robotics, digital fabrication, and additive manufacturing. Participating faculty include Robert Dunay, James Bassett, Akshay Sharma, Nathan King, Jonas Hauptman, and Ed Coe, research assistant with the CDR. These faculty are working with students to establish a new model for industry-engaged...
research. A portion of the exhibit was fabricated through the Center for Design Research residency program at the Autodesk BUILD Space in Boston, MA as part of a global network of Technology Centers created by Autodesk to bring together Academia, Industry, and Design Practice.

The interactive table of the CDR exhibition allows for multiple, individual, hands on discussions and interaction with a large and diverse audience.