Industry Engagement, Autodesk BUILD Space, and the Center for Design Research

Exploring capacities of emerging design technology, the School of Architecture + Design, Center for Design Research (CDR) is advancing its student residency at the Autodesk BUILD Space. (// hyperlink: http://www.autodeskbuildspace.com/) The BUILD Space is a state of the art industry workshop that is focused on innovation within the Architecture Engineering and Construction Industries, offering a neutral territory of collaboration between Industry, academia, and design practice. The 34,000ft² facility is located in the Innovation and Design District in Boston Massachusetts and is outfitted with advanced construction-scale digital fabrication equipment.

Some of the world’s premier architecture and design firms are presently conducting applied research at the BUILD Space. Teams from the offices of Zaha Hadid and Perkins and Will are exploring new building components and construction processes. Working nearby, a team of six students and two faculty (Virginia Tech graduates) from Texas A&M are testing alternative construction techniques. This tensile melting pot of ideation and realization gives students real time access to evolving technologies, but also the chance to interact with professionals pushing the envelope of design innovation.

Edward Coe, B. Industrial Design was in residence in the BUILD Space for eight weeks over the summer working on his Master of Science in Architecture degree.
In December 2017 the first Virginia Tech BUILD Space residency was started with Ed Coe, a graduate student in the Master of Science in Architecture program with a concentration in design technology and novel 3D printing technologies for designers. On campus, Ed is responsible for the management of the Additive Manufacturing research facility (AMP Lab), and has worked with CDR faculty on the development of related digital fabrication infrastructure across the College of Architecture and Urban Studies (CAUS). In order to accelerate his research, Ed spent the month of January in residence at the Autodesk BUILD Space where he was able to concentrate on his work while receiving training on advanced manufacturing tools, digital workflows, and engaging with regional related industry leaders in Additive Manufacturing in the Boston Area.

According to Ed, his time at the BUILD Space “was unique in that it allowed me a compressed development timeline... While we have excellent facilities on campus, the BUILD Space provides a combination of state-of-the-art tools [and] guided training and project support, in a space that affords the opportunity for focused and dedicated time spent on a single focused effort... Here, there isn’t a boundary between the digital design and physical making; the two happen simultaneously—it’s like finally having a current behind my work, instead of having to swim against it to move forward. “

Ed will be returning to the BUILD Space this summer as a CDR research associate as part of his continuing degree work at Virginia Tech. In addition, Pablo Cabrera, graduate student in the Masters of Science in Architecture, will take up residency during the month of July. As part of his research into high

Pablo Cabrera has worked in offices in South America, and in Norman Foster’s office in London. Presently enrolled in the Master of Science in Architecture, he spent four weeks in the BUILD Space this past summer and will return for several weeks during spring semester.
performance building skins, he plans to use the BUILD Space equipment to fabricate a full-scale fenestration mock-up for the Prince William County Eco-Park Learning Center, an ongoing CDR project.

Virginia Tech faculty, Dr. Nathan King, was instrumental in the development of the BUILD Space facility and programs, and currently serves as the BUILD Space Research Strategist. He suggests that “The BUILD Space is a microcosm for types of research infrastructure discussed in relation to the Destination Area programming at Virginia Tech. No matter what incarnation those programs eventually take, the BUILD Space serves as an example of a centralized facility developed specifically to facilitate trans-disciplinary applied research... Opportunities for Virginia Tech faculty and students to engage in such a program outside of Blacksburg will help accelerate and clarify on-campus developments and provide students and faculty enhanced opportunity to engage with industry.”

The Virginia Tech School of Architecture + Design’s Center for Design Research (CDR) technology initiative takes a multifaceted approach that is focused on the creation of new student opportunities, enhanced curriculum offerings, infrastructure development, and functional trans-disciplinary applied research. To facilitate these goals, CDR faculty have developed long-term relationships with industry and design practice. Through collaborative engagement, the CDR is able to move toward sustained engagement with industry partners.

Part of Pablo Cabrera’s thesis work involves high performance building fenestrations. Pictured above is his work at the BUILD Space, developing a prototype for the Prince William County Eco-Park Learning Center research project.
According to Robert Dunay, FAIA, Director, CDR, “This collaboration is part of a strategic vision toward specific institutional goals, probing the beyond boundaries initiatives with critical industry collaboration.” Starting with the first CDR Design Robotics Summit in 2015, Virginia Tech students and faculty worked with an Autodesk product team to collaborate on the first link between Autodesk’s Architecture, Engineering, and Construction (AEC) product, Dynamo Studio™ and the industrial robot. This development led to international workshops taught by Virginia Tech faculty in collaboration with the Autodesk Dynamo™ team. Beyond workflow development, Autodesk was a core sponsor of the MASS Lo-Fab Pavilion (//Hyperlink to: https://vtnews.vt.edu/articles/2015/07/073115-caus-pavilion.html), an architectural prototype created in the CDR Design Robotics Lab and completed in collaboration with MASS Design Group. This project demonstrated the potential for iterative structural optimization-to-robotic fabrication workflow. Installed on the Rose Kennedy Greenway in Boston MA, it attracted over two million visitors. In other related CDR projects, Autodesk and the Autodesk Foundation have been a primary sponsor of Impact Design programs that have yielded built work in Rwanda, Uganda, Hawaii and soon Malawi, and the Impact Design Summit held at the National Building Museum in the fall of 2017.

The CDR hopes to facilitate more student and faculty opportunities in Boston through the BUILD Space. Dunay sees the opportunity as a “…mechanism for breaking out of our conventional patterns of working, expanding our reach, and exposing the students and faculty to the future of design practice... By supporting students in the residency program, Virginia Tech is placed side-by-side with the world’s top design firms forging the next generation of design professionals.”

About the Center for Design Research:
Two strategic, symbiotic foci drive the pedagogical, research, and outreach activities of the Center for Design Research. These areas are Impact Design and Design Technology and are informed by a long history of related applied research, student and industry engagement, and sponsored programs. These projects are underpinned by CDR goals to amplify undergraduate and graduate student exposure to design research and expand collaborative research projects within and beyond the boundaries of the university.

For more information contact Robert Dunay, FAIA, Director, Center for Design Research (dunayr@vt.edu), or Nathan King, Assistant Professor, Co-Director, CDR (nathanking@vt.edu)