HUMANITY CENTERED ROBOTICS INITIATIVE

BROWN

Caitlin Mueller, MIT

"Creative Computing and Fabrication for Performance-Driven Design in the Built Environment"

Thursday, May 16, 2019
12:00-12:50
CIT 477

Abstract: Since Galileo's Two New Sciences in 1638, scholars, engineers, and architects have explored how to shape structural elements and carve material away to achieve strength and stiffness targets while using as little matter as possible. Today, computational methods are available to optimally distribute material in 3D space for maximum performance; however, their use in practice at the architectural scale has been extremely limited for two key reasons. First, designed shapes must incorporate aesthetics, context, culture, etc., so geometries designed solely by the computer without human input are of minimal value. This talk will present new, interactive methods which integrate designers into the shape optimization process and have the potential to overcome this challenge. Second, existing methods typically disregard the construction process. This talk will discuss new directions in digital fabrication that directly link performance-driven computational design of shape with processes for production, fabrication, and assembly. Together, these two research directions offer new potential for shape in architecture to be simultaneously responsive to performance, materialization, and designer intent.

Caitlin Mueller is an academic who works at the intersection of architecture and structural engineering. She is currently an Associate Professor at the Massachusetts Institute of Technology's Department of Architecture and Department of Civil and Environmental Engineering, in the Building Technology Program, where she leads the Digital Structures research group (digitalstructures.mit.edu). Professor Mueller earned a PhD in Building Technology from MIT, a SM in Computation for Design and Optimization from MIT, a MS in Structural Engineering from Stanford University, and a BS in Architecture from MIT, and has practiced at several architecture and engineering firms across the U.S., most recently as a structural designer at Simpson Gumpertz & Heger in Boston.

Host: Daniel Ritchie/HCRI