

Novel Methodologies and Processes: Theories for an Expanded Practice

Biosynthetic Architecture: Generative and Relational Design

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Design & technology have never been more important. A beleaguered planet still in the depths of a pandemic and an urgent climate emergency demand that design and technology integrate to cultivate new collaborative models and transformative, highly creative applications to comprehend key social, environmental, and technological issues. For example, how might buildings behave more like organisms responding to and adapting to their built environments? In the not-so-distant future, materials will not just be elements and things in buildings, they will generate immersive adaptive spaces. Like the cells in our bodies, sensors and imagers will learn and adapt, making materials not only smart, but also aware, sensate, and beautiful. 3D printing, advanced manufacturing, and robotics are transforming how we live, work, do business, and play. Recent advances in computation, visualization, material intelligence, and fabrication technologies have begun to alter fundamentally how we design, construct, and make from the nano to macro scales. We are at the beginning of the 4th Industrial Revolution, a paradigm shift that some historians argue is the biggest to impact design since the medieval period. And as technology has changed the design paradigm, we are facing a global climate crisis. According to the World Green Building Council (WGBC 2017), building and construction account for 40 percent of annual global carbon emissions, which are significantly contributing to global climate change. How do we address these crises? Radical new models are needed for design research, alternative forms of practice, architectural pedagogy and collaboration across disciplines, industries, and practice. One approach entails the hybridization of labs and studios, to fusing innovations across science and design to generate next-generation materials and structures that are adaptive, efficient, smart, and resilient.

This talk will present ongoing trans-disciplinary research and design spanning across the fields of cell biology, materials science, physics, fiber science, fashion, mechanical and structural engineering, and architecture. Sabin's collaborative research, teaching, and design practice focuses on the contextual, material, and formal intersections between architecture, science, and emerging technologies. The material world that this type of research interrogates reveals examples of nonlinear fabrication and self-assembly at the surface, and at a deeper structural level. In parallel, this work offers up novel possibilities that question and redefine architecture within the greater scope of generative design, sustainability, and fabrication. This talk will elucidate the research methods, prototypes, and architectural projects that Sabin and her collaborators have achieved, which include adaptive building skins, fabric structures and ceramic assemblies, and architectural interventions that ultimately (re)configure their own performance based upon local criteria and human interaction.