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Integrated Simulation Workflows for Sustainable Building Design

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Abstract

Since buildings and construction currently account for nearly 40% of total energy-related CO₂ emissions, it is perhaps more essential in our industry than any other to identify and act on the change we expect, need, and want to see. The upheaval induced by climate change will touch every sphere of our lives: environmental, social, technological, cultural, economic, and urban. Sustainability as a longevity mindset is essential to protect them all.

Digital tools allow us to fail fast in a virtual world and perfect built designs. In this process, digital solutions are essential, as they are central to scalability and long-term continuity. We investigate and prototype innovative ideas to unite industries around a common goal: crafting a more sustainable future.

By combining cutting-edge tools with design expertise, the successful integration of smart technology can enhance creative thought and support material optimizations, energy reductions, low-carbon initiatives, and so on. We call this approach a 'holis-tech' mindset. Generative design is a primary component for implementing this 'holis-tech' approach to an iterative design process involving a program that produces a certain number of outputs based on several constraints and conditions. Our 'holis-tech' approach to sustainability advances systemic design solutions where resources circulate at the maximum optimized utility to enrich social, technical, and biological flows.