3D Concrete Printing

Additive manufacturing or 3D printing of concrete is an emerging construction technology that offers many advantages over conventional building methods, including more geometry design freedom, less waste of material, faster construction speed, and lower cost. However, this emerging technology also experiences some major drawbacks. In 3D printing, the concrete is extruded and deposited layer by layer to construct the final structure. Due to the layered construction of 3D printed structures, the presence of weak interfaces may adversely affect the mechanical properties of printed structures. This hands-on project focus on characterizing the mechanical properties of 3D printed structures with different layer structures, interfacial treatment, and printing patterns, and exploring how these factors affect their mechanical performance. By working on this project, students will obtain hands-on experience with concrete materials, explore 3D printing technology in the lab setting, receive training in mechanical testing, and also enhance their understanding of mechanics of materials.

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