1.1 Objective

The main focus in the development of the On-Site Construction Robot (OSCR) is to create a situational-aware "humanoid" that is capable of working to assemble complex structures using green materials. Instead of focusing on the already thriving area of factory-based articulated arms, this project looks to create a minimal-cost network of devices, fitted with sophisticated machine vision technology, to assist workers in the field.

2.1 Methods

OSCR has evolved through the use of highly-precise iterative digital fabrication in the form of CNC milling and 3D printing in carbon fiber, fiberglass, and titanium. The project team completed the fourth iteration of humanoid (OSCR 4) last year and is currently working on a larger scale design for OSCR 5. A range of motors has allowed the team to apply the characteristics of earlier, smaller OSCR iterations to the current, larger scale. The integration of design with software and interface provides new architectural design opportunities while also elevating the role of masons from skilled labor to skilled technicians who operate OSCR.

2.2 Applications

OSCR facilitates an infinite number of architectural design possibilities and applications, allowing for the precise creation of complex curvilinear forms in a medium that is largely orthogonal. OSCR also has an application in the reconfiguration of interior space through the use of stackable, modular units. Starting with a mass of uniform units, OSCR can re-stack them to create any type of interior configuration, which could have a revolutionary use in art galleries and lofts.

3.1 Onward

OSCR 4 is currently being programmed, OSCR 5 is currently being designed and, once finished, will be tested in the field.