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TRANSDISCIPLINARITY IN SPACE ARCHITECTURE WITH PARAMETRIC COMPUTATION

Abstract

Space architecture, or the built environment in outer space has, not unlike its naval cousin, existed in tangible reality as a prototypical engineering feat destined, for the time being, to be experienced by those made of 'the real stuff'. It has also, however, existed and in fact proliferated within science fiction film and literature to the point of becoming a ubiquitous element in popular culture.

While there has been an appreciation of this qualitative, (pop-) cultural-fictive resource, evident for example in Peldszus, Dalke, and Welch's paper, Science Fiction Film as Design Scenario Exercise for Psychological Habitability: Production Designs 1955-2009 (2010), there has lacked the necessary framework for the inclusion of such analytics to be incorporated into a rigorous, yet dynamic framework that can result in serious, quantifiable output.

Digital computational design software can provide such a framework, allowing for the curation of a complex collection of quantitative and qualitative dynamic inputs. The concept of an architecture that is not earthbound, which therefore exists apart from the traditional design constraints such as site, gravity, and atmosphere, requires the establishment of a novel design framework.

New inputs – defining limits and opportunities – can be agglomerated within a digital computational model that responds to dynamic data-streams across a variety of quantitative and qualitative classifications. For instance, a data input of the classification 'GDP' according to nation or state could co-exist alongside a data input classified within 'Amenity' to inform the dynamic manipulation of a virtual model of a proto-typical space architecture.

This dynamic digital computational model can therefore be used to rapidly prototype multitudes of scenarios exploring space architecture from the combinatorial inputs of cultural, scientific, speculative, and economic conditions. A transdisciplinary practice emerges that exists as the virtual and the actual within mediums across architecture, engineering, science fiction, history, and mythology.