

“Epistemological Constructions”

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Abstract

The epistemological debate of accepting the rationalist or empiricist world-view comes down to us in contemporary digital fabrication as the “virtual verses physical” argument. This idea is emphasized by the fact that digital fabrication bridges the virtual and the physical, and therefore this dichotomy is worthy of our examination and critique. Architectural experimentation and research in the field of design, particularly that of the scientific and technological emphasis, needs to engage a physical manifestation during all points of the concept to product timeframe. This cannot only happen as the end result of the process.

We are at a time of critical self-reflection in digital design and digital fabrication in architectural research, not unlike the era of the second industrial revolution of the late nineteenth century, where the age of modern invention eclipsed the increased production and efficiency of the previous era. It is truly a time for a redefinition of the role of digital design, fabrication and assembly in the greater architectural project of research, academics and practice.

The methods and arguments we have evolved to discuss and produce architectural design through the application of digital methods has focused of the technique of proving a design hypothesis, to cast it in the mold of the scientific method. This search for the optimal, and the need to produce at ever accelerated rates, has naturally shifted most, if not all, design experimentation and evaluation into the realm of the virtual through computational simulation, only manifesting physical reality (if at all) as an end product.

We must simultaneously engage the empirical method of research in order to develop hypothesis, and therefore treat the architectural construction as a demonstration rather than a proof. This focus of research can merge the hypothetical-deductive logic of rationalistic thought with the exploration and sensory engagement of empirical methods in digital fabrication through attention to continuous physical experimentation and critical reflection.

As architectural tends to produce a unique environment, the process of construction requires an enormous amount of control that, while potential in the construction industry, is often impossible in architectural research. We begin to feel that since we can control every aspect of the simulation, we can do so in the manifestation, due to the nature of the precision of our tools, but this hyper-control works counter to the physical reality of construction. Notice that I did not include tools, and this is intentional. The tools we use change, be they software, machines, methods, stylistic guidelines or theories. What remains is our interest in exploration and our ability to learn from our successes and mistakes.

The Architectural Researcher of the future must be like Sherlock Holmes: investigations must be composed of logical steps that can be proven, but must be directed by an intuition that is empirical, critical and on occasion irrational. There is no rulebook for Architecture, only general principles and experience and practice.

Bio

Mr. Anzalone is the Director of the Building Science and Technology Sequence and the Director of the Avery Digital Fabrication Laboratory at the Graduate School of Architecture, Columbia University. As Director, Mr. Anzalone leads research and curriculum related to applied and experimental building science and technology, digitally based design, fabrication and assembly techniques, as well as numerous creative constructed projects at the School. Research conducted in the past by Mr. Anzalone includes the Trusset System, a patented CNC manufactured three dimensional differential space-truss (with Cory Clarke), Amphorae, an innovative concrete blocking system using Ductal, the IC Solar Module System, a dynamic solar shading façade system (in collaboration with Anna Dyson of RPI), and Augmented Reality in Architectural Construction (with Anthony Webster and Steven Feiner). Mr. Anzalone has written and participated as a Principle Investigator and Consultant on numerous grants including Department of Energy projects, NSF – IGERT grants, NYSERDA building system grants, and university institutional funding. Current research projects include chairing the committee on developing curriculum to research the future of the building industry as part of the GSAPP’s new C-BIP initiative, developing a novel tensegrity structural system for projects in New York and The Netherlands, incorporating greenhouse spaces into building systems in urban environments (with Natalie Jerimijenko of NYU and SunWorks NY) and researching a direct manufacturing workflow system incorporating digital fabrication and assembly with augmented reality technologies. Mr. Anzalone teaches classes related to computer-based fabrication, building structures, advanced material studies, industry collaboration and architectural detailing, as well as graduate level design studio.

Phillip Anzalone is a Registered Architect with experience as a curtain wall consultant for R. A. Heintges & Associates, as an architectural designer with Greg Lynn Form, and is currently a partner of Atelier Architecture 64 (AA64) with Stephanie Bayard. AA64 is a Brooklyn based Architecture firm specializing in the design and production of projects involving exploration and integration of traditional and advanced materials and processes, with built projects in New York, France, San Francisco and South Korea. His practice focuses on how new materials and technology can enable architectural design through innovative practice with projects ranging from residential and commercial work, through installations and pavilions, to furniture and architectural objects. AA64 is involved in the design as well as the construction of projects, utilizing both traditional and contemporary methods of fabrication and assembly.

Mr. Anzalone’s recent work has been published in ArchitectureWeek, ACADIA, Oculus, ACSA and the International Journal of Architectural Computing, and has been presented in numerous lectures including those at Columbia University, the AIA-NY Center for Architecture, Pratt Institute, Cranbrook Institute, University of Illinois at Chicago, Ball State and the Academy of Fine Arts in Vienna. Phillip Anzalone holds a Masters of Architecture from Columbia University and B.P.S. Architecture from SUNY Buffalo, with a minor in Business Administration.