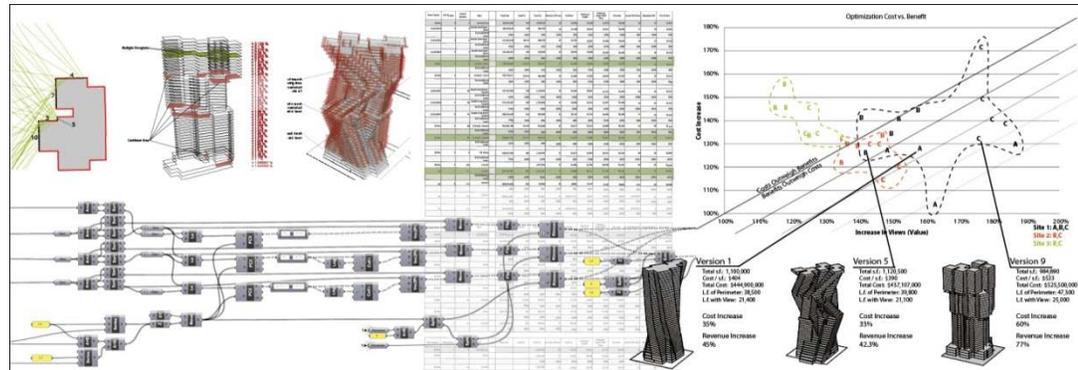# INFORM FORM PERFORM

Nate Holland[1]

Figure 1. A digital design process using the generative power of Galapagos within Grasshopper to analyze, optimize, and evaluate building form to increase the real estate performance of architecture.

Abstract

"Within contemporary architectural design, a significant shift in emphasis can be detected - a move away from an architecture based on purely visual concerns towards and architecture justified by its performance." (Digital Morphogenesis) Architects have developed and employed parametric design strategies to both address these performance related concerns and improve their production. Though these strategies have improved architectural design, they are not being used to their full extent in the design process. I propose taking the use of computers in aiding architectural design one step further; information and data should INFORM the project, driving the creation of a building FORM enabling it to PERFORM at higher levels than traditional design.

As architects continue to improve these tools, owners and developers tend to choose an opposing strategy. They often finance cheaply built (and poorly designed) buildings in an effort to reduce the upfront costs of the project. However, in economics reducing costs is only part of a good financial decision. The other half of the equation is increasing the revenue generated by the project. I further propose that by investing in an informed design/decision making process, investors would be able to fund projects that perform better and bring in significantly higher revenues.

Through optimization and parametric relationships between core design elements and ideals, architects will be able to achieve higher levels of design both in aesthetics and performance (Revenues, Orientation, Views, Circulation, Structure, Proximities, Site Conditions, Zoning Codes, Programmatic Requirements, etc.). The evolutionary solver "Galapagos" within Grasshopper allows parametric scripts to test and optimize the negotiation between these different building elements. The script generated
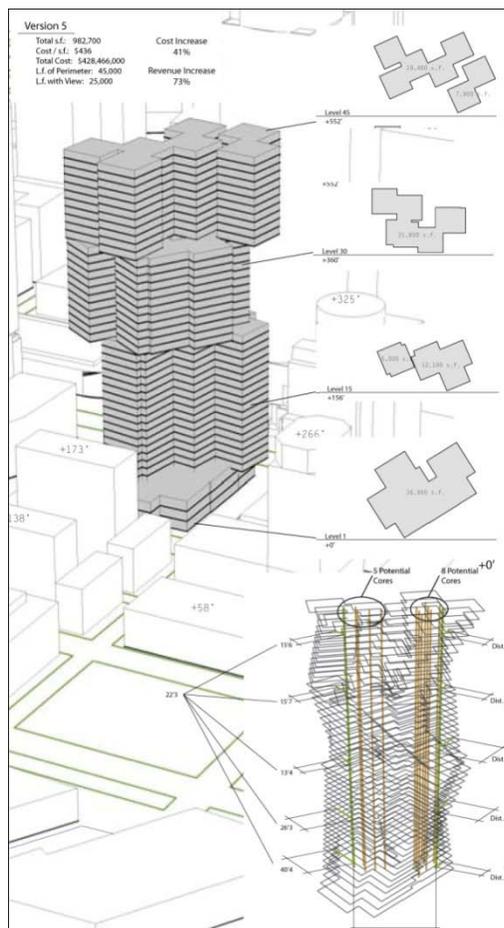
Figure 2. A composite analysis of a building massing and its floor plates demonstrate the evolutionary potential of this system to create a nearly infinite variety of architectural conditions for further evaluation and consideration.

for this project outputs extensive families of building iterations and tests them against each other to find the highest performing results with only minor changes to the input parameters. As the computer begins to take on some of the traditional roles of an architect Neil Leach argues that, "It is not that the architect here is any less imaginative; rather the architectural imagination has been displaced into a different arena - into the imaginative use of various processes" (Leach).

In this generative grasshopper script, the computer acts as a design aid. The architect "is still ultimately responsible for design intent and needs to be able to look at the big picture to decide which factors to parameterize, to give limits to the parameters, assign a weight to each factor and determine the order and method of the information modeling process"(Ottchen). In response to that the script is broken down into a tiered system of development allowing for frequent intervention and adjustments based on user design preferences for performance, organization, or aesthetics. Within this type of informative design processes data flows from one level of design to the next; information gathered and created through the preliminary phase continues to form decisions throughout schematic design and design development. It is only through the collection and interpretation of information that this entire process becomes possible, data must Inform Form before it can Perform at its peak.

References

Ottchen, Cynthia. "The Future of Information Modeling and the End of Theory: Less Is Limited, More Is Different." Architectural Design 79.2 (2009): 22-27.
Leach, Neil. "Digital Morphogenesis." Architectural Design 79.1 (2009): 32-37.

[1] Nate Holland, nholland@huskers.unl.edu, MArch/MBA student, University of Nebraska - Lincoln