ICAR65

1st Genoa Symposium

Form *after* Form

On the relentless emergence of new (architectural) forms

September 22nd, 2014
Università degli Studi di Genova, DSA

Form after Form
On the relentless emergence of new (architectural) forms

Architectural design has always been connected to geometry; modern technologies, especially the tools of digital design, definitely modified how the form itself is conceived. Even though architecture is experiencing significant changes in design methods and approaches, the relationship between shape and material remains a key factor: computer aided design allows a new definition of this relationship. 3D digital models and parametric processes make possible to produce impressive virtual forms and showy renderings and, in some cases, to build them. To avoid the initial fascination, we need to consider the technological upheaval of digital tools as a starting point to upset architectural design method.

We need to maintain a two-way relationship between material and form during all the phases of the design process to avoid disappointments coming from misleading expectations. For these reasons it seems interesting to investigate the relations between form, design and optimization.

PROGRAM

14.30 **Katia Perini** and **Gian Luca Porcile** for ICAR65 with **Andrea Quartara**
Introduction

14.45 **Nik Nikolov**
Structural topology optimization in architectural design

15.30 **Patrizia Trovalusci**
The recovery of the ethic of constructions: P. L. Nervi vs S. Musmeci, two structural conceptions compared

16.00 **Mario Sassone**
Computational Morphogenesis of Shell Structures

16.30 *Break*

16.45 **Chiara Calderini**
Shape optimization: what about uncertainties?

17.00 **Giulia Curletto**
Parametric modeling in form finding and application to the design of modular canopies

17.15 **Luigi Gambarotta**
Notes

17.30 Poster session with:
Andrea Aicardi
F(lux)CO NORTH. Fiumicino Airport, Rome
Andrea Anselmo
The structure of void. The aesthetic potential of self-organized structures
Elena Balossino, Giada Barla
Algorithmythology. An overvew of architectural debate, in search of emergent narratives in the digital age
Eleonora Buffa
8 Forms of Architecture - 20 Architectures of Form. Selection of innovative projects realized between 1998 and 2010
Andrea Quartara, Giulio Dini
[In]forming form. Generation and mutations of an urban algorithm
Alessandro Tinelli, Patrizia Trovalusci
Structural optimization vs. shape design

Discussant:
Nik Nikolov, Patrizia Trovalusci, Mario Sassone, Chiara Calderini, Giovanni Galli, Luigi Gambarotta, Christiano Lepratti, Fausto Novi

19.00 Closing Remarks

The structure of void
The aesthetic potential of self-organized structures

Andrea Anselmo

In the history of architecture, many architects based the development of their projects on strong static and structural considerations. To do this designers such as Gaudi, Musmeci and Nervi have used analogical models to simulate what would have been the constructed building. Over the years, advances in computer science and technology have led to a great improvement in the ability to design and calculate bold structures. Nowadays, digital models have in fact integrated analogical ones and have allowed the design and implementation of highly complex structures. In years where the desire of innovation is combined with the need for careful management of resources, the thesis examines the possibility of developing strategies for designing free-form structures with a structural performance and the ability to save construction material. The thesis is therefore divided into two parts: first the research and exploration of techniques for structural optimization and form-finding; second, the application of these studies in a project, that aims to highlight the contribution that the results could have in the architectural field. The first phase was aimed at testing and developing morphogenesis algorithms with open-source software. The most investigated fields were topological optimization and swarm intelligence, finalized to structural optimization. The second one aims instead to develop an architectural design able to highlight the potential of these tools by using some of the techniques listed in the research phase's catalogue. The project primarily aims to symbolically represent what could be the most extreme implications of those techniques in architecture.

Algorithmythology. An overvew of architectural debate, in search of emergent narratives in the digital age

Elena Balossino, Giada Barla

The starting point of this reflection on contemporary architecture is inspired by an essay appeared in 2005 on Casabella, in which Rafael Moneo investigated the concept of arbitrariness of form in architecture by outlining an historical path from Vitruvius to Peter Eisenman, pointing out architecture's constant need to justify its own forms so as to exclude their arbitrariness.
For that purpose, architecture has historically drawn upon tales or narratives, in order to eliminate, or at least to mask, the arbitrary and subjective factor incident to any artistic practice. Architecture practice has always been related to a theoretical and linguistic sphere which acts like a framework able to legitimate design choices. From Vitruvius