

FREEDOM OF FORM: THE ORIENTAL CALLIGRAPHY AND AESTHETICS IN DIGITAL FABRICATION

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1. Introduction

Computer-Aided Design (CAD) / Computer-Aided Manufacturing (CAM) related research has been discussed since the 1960's (Ryder, G. et al, 2002, Mark Burry, 2002). Indeed, both Frank O. Gehry and Toyo Ito utilized CAD/CAM to create rich architectural form and in so doing gave birth to a new type of aesthetics. The visualization and liberalization of form space is the single most important characteristic attributable to the use of computers as a design tool. By the 1980's, Laser cutting and Rapid Prototyping techniques developed from CAM, became important new digital tools when researchers and designers discussed the development of form in architecture.

2. Background and Problems

In Asia, oriental calligraphy is firmly positioned somewhere between philosophy and plastic art. Calligraphy is more concrete than philosophy, infused as it is with a sense of a real world, but at the same time it is also more abstract and wisdom than painting or sculpture. If oriental calligraphy is analyzed in terms of structural order and emotive change as seen from a pure shape perspective, it is inevitably nothing more than aesthetic meaning (Yao, 1993). In terms of cognition (E. H. Gombrich, 1998); there are very clear east-west differences in terms of calligraphic space, form, color and even materials (Xiong, 1999). The structure of calligraphy comes from a set order and rules governing form, just as natural beauty originates in the same principles. As such, it is not necessary to understand calligraphy from the perspective of nature. Instead one should seek to grasp the rules of form directly from calligraphy itself.

When discussing and experimenting with the creation of free form (Santiago R. Perez, 2004), the Digital Fabrication process often makes use of geometric, fluid dynamic and biochemistry methods, combined with Laser Cutting and Rapid Prototyping. However, such an approach is still insufficiently comprehensive. This paper attempts to analyze the aesthetics and understanding of calligraphy and through Laser Cutting and Rapid Prototyping methods (Kolarevic, B. 2003), discuss the relationship between calligraphy and free form. In addition to establishing a theoretical model for cognition and analysis, we also attempt to use both Digital and Physical methods to probe the structure and model of space and free form in oriental calligraphic aesthetics.

3. Methodology

The use of different materials at the conceptual stage, allows the designer to look at different variables in terms of his or her design behavior and visual considerations (Won, 1999). Operationally, our experiment is divided into two stages in this paper. There are three steps of one stages: the first step, proceed immersive writing toward calligraphy, experience the characteristics like abstract and wisdom, momentumthe in spirit and meaning of calligraphy, then proceed the analysis and conclusion in esthetics. Step two discusses the written points, lines, black, white methods of traditional calligraphy and uses collages, abstraction, sculpture, photograph and deconstructionist experimental methods. Step three analyzes spatial structure and shapes from the 2D without any computer assistance and then utilizes virtual and digital methods (3D modeling, scanning, pen-based system) to analyze digital transformation methods and discuss the difference between traditional and digital media (Wassim Jabi, 2001). Stage Two takes the results of three steps experimentation of one stage and analytical data and uses it to produce a model with Laser Cutting and Rapid Prototyping. The resulting prototype models are gradually reinterpreted and compared and the differences between them analyzed, resulting in the creation of a general theoretical model.

4. Conclusion

This paper is not established on any ultimate model or theory. Rather it we discuss the hidden possibilities for free shapes in the Digital Fabrication design process through an analysis of aesthetics and cognition. It is hoped that the combination of theory and model operation methods will make it possible to highlight the aesthetic value of calligraphy in terms of free form.

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