

The Danteum

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Abstract

The Danteum was a building designed for Rome in 1938 by two eminent Italian architects, Giuseppe Terragni and Pietro Lingeri. Due to the defeat of their client, Mussolini, in WW II, the project was never realized and became one of the best known unbuilt modern projects. Through the use of advanced computer graphics technology, an attempt has been made to simulate a walk-through experience of light and materials inside this unbuilt monument. This animated representation revealed two of the important spatial characters embedded in the design of this building: a constant oscillation of dark and light as well as that of closed and open.

Keywords: Danteum, Terragni, Lingeri, Radiance

1. History

The Danteum, a building designed in 1938 for Mussolini, was never physically realized, but its significance in the context of the European modern architecture movement has been much studied by many architectural historians such as Thomas Schumacher [1], whose documentation is utilized as the main archival source for this investigation. Among architects, the Danteum is also well known for its uniquely allegorical organization of space. According to the text by its architects, Terragni and Lingeri, a visitor to the Danteum would pass through the chambers designed after Dante's spatial description in his Divine Comedy for which this building was dedicated.

2. Spatial Investigation

A daylight visualization was conducted through the use of computer graphics technology. The initial still images produced were those matching the archival perspectives painted by the architects for Mussolini in watercolor. In the chamber of Inferno, the sun beam falls through the cracks in the ceiling slabs. In the chamber of Paradiso, thirty three refracting glass columns soar into the sky. Then the animated investigation focused especially on the highly effective use of oscillating spatial qualities along the journey from the entrance court to Inferno, Purgatory, Paradiso and Impero. As visitors pass through these chambers and their connecting spaces, they would be subject to a constant oscillation of dark and light as well as closed and open, hence a constant adjustment of the pupil exposure and focal distance of the eyes is required. The animated simulation revealed this by one long uninterrupted camera movement set at the human eye level, from the entrance all the way to Impero.

3. Simulation Technology

For precise light and material simulation, a global illumination software, RADIANCE [2] was used in combination with a custom-made walk-through generator program. Every frame of a 5 minute sequence was first rendered into a 4-byte .pic image, then filtered down into a regular 24-bit color image. The filter, as a pupil, adjusted each frame's exposure and achieved appropriate transition between bright exterior and dark interior space.

4. Conclusion

Unbuilt projects, such as the Danteum, are often an architect's most ambitious and visionary work, which excite our architectural imagination. However, it is difficult to reveal their spatial experience due to the limitation imposed by the historical analysis of text, drawing, model and other conventional resources. A computer graphics representation could shed light on the hidden spatial qualities of an unbuilt structure, which often exist only in the mind of the original architect.

Acknowledgments

The computer graphics video production of *The Danteum of Giuseppe Terragni and Pietro Lingeri* was partially made possible through a generous grant from Takenaka Corporation of Japan. I thank Haldane Liew for assisting me in the visualization work and Ben Black for the preliminary model.

References

1. Thomas L. Shumacher, *THE DANTEUM*, Officina Edizioni, Rome 1980
2. Greg Ward Larson's development. Detailed information on RADIANCE is found at <http://radsite.lbl.gov/radiance/HOME.html>