Abstract of Master's Thesis Academic Year 2012

Space planning method using feedback from aerodynamic analysis

Summary

Aerodynamic analysis based on CFD technology has developed dramatically. Although, the technology brought users rapid and convenient opportunities, it is not being connected well enough to BIM and it is not fast enough to call it instant. As the expected needs for quality and the volume increases, time will be needed with high spec computers. This negative effect holds the users back from the repeated use. Even in architectural planning and space planning, when the repetition of aerodynamic analysis is necessary.

First, we tested in a competition with the aim of planning with the repeated use of aerodynamic analysis as a feedback, on the premise that aerodynamics has a great importance in planning studies. This experiment clarified the problems of repeated use in aerodynamics in planning, such as; analysis may become inefficient and ineffective under the condition of analyzing great volume, the condition of optimized ventilation and other additional conditions may not be compatible, the combination of items to greaten the optimizing ventilation is unlimited, and planning theory that relies on analysis can not be solved without having a view beforehand.

This paper used experiments of "problem-solving type" repeatedly, rather than "phenomenon-confirming type". "Problem-solving type" postulates repetition in analyzing small volume in order to have a deep understanding of ventilation and its shape. Also, the criteria of evaluation must be loose. The criteria of evaluation should not select the best one design, but the better several designs. As a result, the experiment succeeded in making multiple numbers of large architecture office with both spatial diversity and well ventilated environment. Also, looseness in criteria of evaluation succeeded in giving allowance to freedom in other design criteria.

We wish this procedure would help create new shapes in environmental architecture.

Key Words

1. aerodynamic analysis 2. ventilation 3. feedback
4. space planning 5. allowance

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