

Abstract

Overall Thermal Transfer Value (OTTV) calculation is currently one of the most important factors that must be integrated into architectural design process for energy conservation. Therefore, there are softwares for calculating variables and complicated mathematics equation on OTTV analysis, which work relatively well. But in-depth study finds that these softwares are developed based on personal computer which have limitation on connecting or adjusting material database to the analysis part of the software.

This research attempts to develop a software with Java technology to enable the software to run on a network server through the internet. This will help suppliers to update the material database, thus helping users to have better material selection. For the Graphic User Interface part, Java3D technology is chosen for developing two and three-dimensional virtual environment so that architects can create the architectural design with more efficient energy conservation.

The result of this research will improve the Overall Thermal Transfer Value analysis process and give a set of architectural design guidelines for energy conservation. Further, this software is an easy-to-use tool which can insert and select data pattern. This software can also calculate and illustrate OTTV with building's basic cost estimation. In addition, there is an Edit-Materials system that allows users to add, remove or change and update the materials database.

In order to test the accuracy of the software, two real existing buildings, Bio-solar House and Energy Conservation for the King Building are chosen for calculating OTTV by using OTTV-EE Software which is developed and published by Ministry of Energy. The calculated result is compared with that from the software. It is found that in all cases the differences are not more than ten percent from OTTV-EE calculated values. We hope that the software "Overall Thermal Transfer Value Analysis-based CAAD Software" would be a guideline to create architectural design support tools in the future.