

Use of Computational Tools in Architectural Design and Industry

Simulation of Energy Performance in Buildings

by

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Abstract

Technological advances especially in the field of computing and mathematics has made possible many quantitative calculations that were previously daunting. The development of affordable computing and easy-to-use software has now made analytical tools available to the architect to employ in the processes of design synthesis, development and presentation. We can already appreciate how Computer Aided Design (CAD) packages and imaging softwares complement the traditional design processes and presentation.

However, these new tools are usually employed merely as new means to the same ends and do not qualitatively affect or improve design processes or design solutions. To maximise the potential of such new tools in architecture, we need to study how they can be new means to new ends, where such tools enable new knowledge and develop new concerns, methods of design investigations and visualisations in architecture.

This dissertation shall attempt to investigate how such new technological tools, with specific focus on energy simulations, can be employed within architectural design and practice in Singapore, where there is currently a lack of systematic approach in terms of the concern for energy performance of buildings. This dissertation aims to explore recently developed tools that allow accurate predictions of energy performances and how such tools can be used in the design process as well as contribute to the architect's understanding and concerns of energy relationships in buildings.

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