

Incorporating the FEM Analysis in the digital design process

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Conceptual architectural design is often apart from tactile or visual aspects not in any way materialized. In the Building Technology Department of Architecture Faculty we specifically focus on the materialization of architectural concepts emphasizing the reciprocal relationship between design, material and production techniques.

Students use computer in support of the design process in the various phases of design and built a virtual master model that serves as the source for the various required geometrical data used for analysis and rapid prototyping. In the sketch phase the CAD programs as Maya and Rhino are used for advanced curve based modeling. The challenge is to generate an accurately defined virtual master model to be used as a source of conversion of the virtual design description into a format which is supported by analysis software and can be used for rapid prototyping techniques.

The development of new interfaces and possible scripts to integrate a FEM analysis in the digital design process is a part of the recently started Computation and Performance research program. One of the bottleneck while employing the different assessment tools in early design and planning stages is that those are hardly compatible with the extremely dynamic nature of these early stages. Here, options would have to be evaluated quickly, but since the different software packages are not communicating in real-time with each other, the designers and planners are not able to keep up with the pace while importing/exporting/converting large amount of CAD data back and forth.

In this presentation we will discuss some problems and solution to a data exchange between CAD programs and Diana program based on student work. Different approach for different geometrical problems will be presented.