

VRVis K1/IVC_MULTI
VRVis Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH

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Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH

ENERGY EFFICIENCY AND SUSTAINABILITY IN THE BUILDING SECTOR

A VISUALIZATION AND SIMULATION PACKAGE FOR THE ENERGY PLANNING OF BUILDINGS ENABLES AN OPTIMIZATION IN ENERGY EFFICIENCY AND COMFORT.

In Austria, about half of the energy consumption is due to the heat consumption of buildings. In new construction and also in renovation, energy efficiency is an increasingly important topic not only for cost reasons but also in terms of sustainability. InPlan and VRVis research a visualization and simulation package for the energy planning of buildings, which enables an intuitive optimization in terms of energy efficiency and comfort.

Change in building design: from drawing board to BIM

Since the introduction of CAD technologies, the building design industry has been transforming from drawing boards to digital systems. As a result,

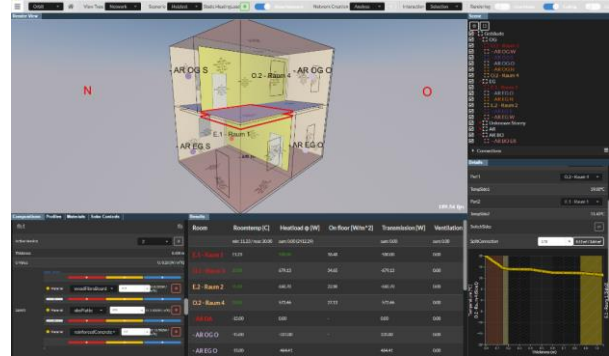
buildings and technical building equipment are increasingly being created in 3D software programs. In the process, a lot of data is generated by the numerous planning participants from architecture, building physics, statics, and planning of the technical building equipment. In order to centralize this diverse data and to be able to use it more efficiently, Building Information Modeling (BIM) is becoming more and more prevalent with the help of the ifc data format. In the course of the planning and execution phases of a building, a digital twin is created with the help of BIM, so that the building can be visualized for operational management and the decisive operational data can be clearly retrieved.

SUCCESS STORY

Energy-efficient planning in conjunction with BIM and digital twin

An essential factor in addressing the climate crisis is the efficient use of energy to condition buildings. To combine energy-efficient planning with BIM and digital twins, VRVis and InPlan are researching a new software tool, which integrates simulation algorithms into the BIM world and casts them into a handy digital tool. This tool supports planners in all aspects of energy efficiency and HVAC (heating, ventilation, and plumbing) during the planning process. The digital building twin not only contains data but also clearly shows the dynamic behavior on cold winter days or during hot spells. The focus of the planned software package is on standard-compliant designs that ensure comfortable temperatures on the coldest winter days on the one hand and the summer suitability of buildings on the other. These calculations are part of the daily planning routine of building physicists and

building services planners. The project represents an important research contribution to raise the planning quality of energy planners and to further increase the energy efficiency of buildings.



Since there is a mutual influence of the thermal behavior of rooms, the neighborhood relationships are automatically recorded, so that through the model there is a thermal network (BEM - Building Energy Model). © VRVis

Project coordination (Story)

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- rmDATA GmbH
- Zumtobel Lighting GmbH
- InPlan Ingenieure GmbH
- TU Wien
- TU Graz
- Joanneum Research

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