

VRVis Center

VRVis – Visualization, Rendering and Visual Analysis Research Center
Programme: COMET – Competence Centers for Excellent Technologies

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DSS - GearViewer, 01/2014 – 12/2016, multi-firm

Decision-making through interactive infrastructure visualization

There is a strong demand for comprehensible visual information supporting the planning phase, especially with complex infrastructure projects. The visualization system developed in the GearViewer project allows the merging of complex planning content with additional simulation results and scenarios. It provides the means for spatial representation and analysis in an interactive 3D-environment and was successfully applied within several participatory planning processes. GearViewer is a valuable tool that facilitates the discussion and decision-making for both nonprofessionals and experts by providing a variety of media and information.



Interactive infrastructure visualization for decision-making

The visualization of large and therefore complex, dynamic infrastructure projects has become an important tool during planning, public presentation, realization as well as for maintenance and operation. The GearViewer project serves to merge, visualize and analyze different types of georeferenced surveying- and planning-data in a powerful, interactive 3D viewer.

GearViewer can be closely linked to existing workflows and databases. It provides support for high dynamic scene elements such as the realistic depiction of road and rail traffic, based on measured or simulated traffic statistics. Given an appropriate database, the scenes can be created automatically with a very high level of detail. By manually adding and editing further data, even more complex scenarios can be illustrated in highest quality and a more realistic way.



Fig. 1: Interactive 3D visualization of a scene automatically generated from a database. It is based on surveying and planning data with links to external documents.

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Public citizen presentations

The system is primarily used at public relation events and meetings, where it fully supports the entire flow of information of the respective planning project with a wide range of media. The spectrum ranges from interactive live demonstrations and discussions with stakeholders and decision-makers, to traditional print and film media as a supplement. Furthermore, it also features web-based technologies such as interactive panoramic tours.

The major strengths and decisive advantages over conventional 3D GIS approaches lie in the possibility of merging both heterogeneous and partly abstract data from various planning disciplines in one system, as well as displaying simulation results in their actual spatial context. Visualization in an interactive 3D scene considering temporal aspects can render interrelations in planning projects very clear and understandable. This enables both nonprofessionals and experts to communicate on a common ground. The same equally comprehensible information is available for all parties involved. Questions and problems can be discussed on a sound factual level and conflicts are easily resolved.



Impact and effects

As described above, the GearViewer makes an important contribution at all levels of participative planning and informing citizens. The experience of countless practical applications shows that it can help to optimize planning processes and avoid mistakes. Large infrastructure projects such as road, rail or electricity networks in particular, have complex and far-reaching impacts on the environment and various aspects of life. Each optimized planning step and every correct decision has numerous positive effects. The GearViewer visualization system is a tool that makes an important contribution in this application domain.

Various positive application examples in renowned Austrian large-scale projects has also gained international attention. For example, GearViewer is deployed in the bilateral flood protection project "Alpenrhein", as well as in one of the largest road projects in North Rhine-Westphalia, where it met broad approval.

The research and development that led to the creation of this comprehensive planning tool is consequently pursued to further expand and optimize the range of application. In light of the ongoing developments related to the topic of BIM, this project is more relevant than ever. With its modular expandable design, the system is ready to support future data standards and processes. The complex topic both in terms of content and in terms of the technical level require a highly skilled staff. A team of collaborating experts at the technology location Vienna contributes to the overall success of the GearViewer system.

The demand for interactive information tools in planning processes will continue to rise. GearViewer already successfully shows, which opportunities arise for decision-making and will continue to support these processes in an optimal way.



Fig. 2: Project visualization of the planning area Vienna "Aspern". Application example with a complex interaction of various infrastructure carriers and planning projects (Asfinag, ÖBB, WienerLinien, City of Vienna).

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based on data from: City of Vienna - data.wien.gv.at

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Further information on COMET – Competence Centers for Excellent Technologies: www.ffg.at/comet

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