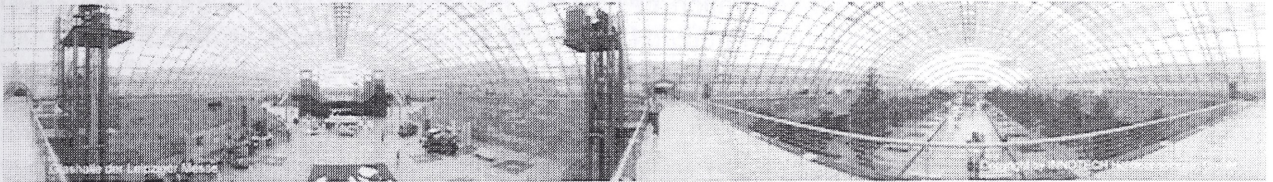


## "Photo-realistic visualization of objects and scenarios"

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### **The Enterprise**

Since 1992 the Innotech has itself specialised in photo-based visualization, beginning with the simple object representation before background pictures, over photo-realistic and full-scale presentation of objects before background pictures up to the movement by photo worlds. As result of its application orientated research and development activity the enterprise developed constant digital technologies and procedures, which enable a photo-based representation of objects before background pictures. The enterprise is responsible for the marketing of the innovative products. They are also used for services. The network from engineering specialists and software developers enables the enterprise to offer customized, non-standard solutions. Therefore it is at any time possible to create non-standard data bases and object libraries, to merge these into a visualization in order to develop virtual information systems. The enterprise strives to offer solutions which are PC, laptop and Internet executable.

### **Theses**

Today close-to-reality visualizations are a lot more than only object visualizations. They actually contain the object scenario, represent it in its closer environment and show regional, if necessary also supraregional references. Therefore visualizations increasingly take over not only representative optical functions, but form the base for the structure of complex information systems and virtual communication platforms.

Independent from advancement in future, the public effective representation requires a playback quality which is common to most humans and which is shaped by film, television and video. That means that a photo-realistic representation quality must be used. For complete information the presentation of results is possible by help of the Internet, non-standard presentations on PC displays and demonstrations on large screens. In addition a duplication of individual visualization results over printed media is supported.

## Solutions

In order to fulfill this requirement the following innovative technologies, developed by the Innotech Holztechnologien are at disposal:

- Digital very high resolution documentation and measuring system Sasta metric (very high resolution digital rotation scanner with appropriate software modules), world-wide singular system
- Software SASTA soft for the rule-based implementation of objects before background pictures and the photo-realistic visualization of a status before the implementation, product leading the market in the area of application of the element manufacturers of Germany
- Data base on the basis of vrml for easy and interactive use of 2d and 3d objects on the basis of any reference grid (input, administration of objects, movement by virtual worlds), result of a research project, applications under <http://o4.f4.fhtw-berlin.de> (city model, vrml scene)
- Special softwaretools for local independent communication of several users in a virtual model

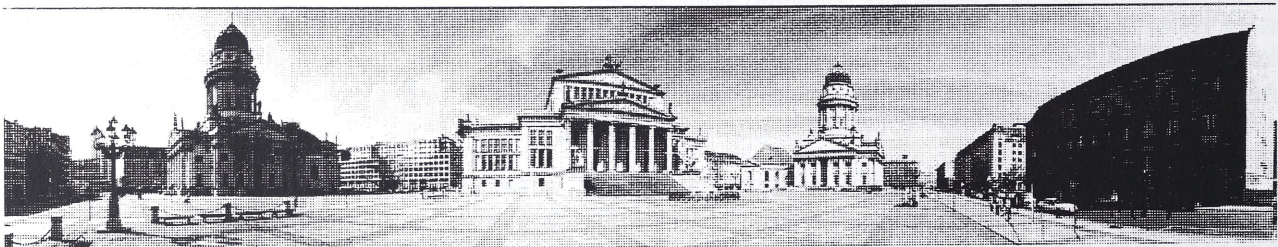
## Applications

### 1. Digital status documentation

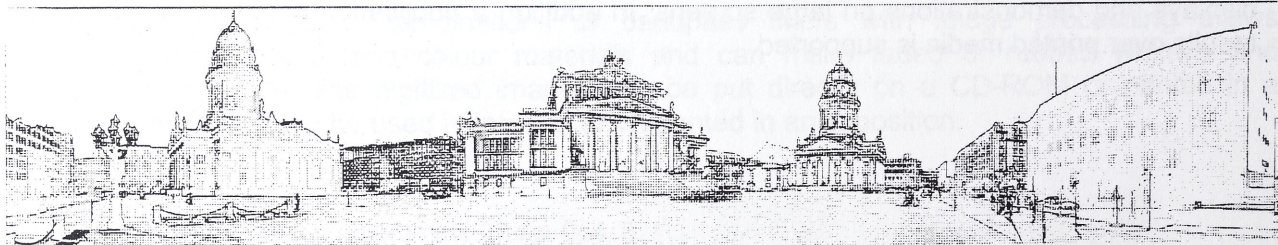
The digital status entry of existing scenarios such as river landscapes, workstations, silhouettes, road courses, industrial areas and harbor facilities is implemented effectively by accommodation of 0-360° panoramas (wide angles and/or round view).

These round views and panoramas are produced in a very high resolution with a special rotation camera. The image file is present immediately after the accommodation. The short accommodation duration for a digital panorama enables the daily supply of several image files. The process of the digital picture recording is arranged very effective in this way. The max. picture resolution enables enlargement up to 24 times of picture details by near zoom or a detailed view of objects far away. Thus the accommodation technique is suitable also for interesting and important objects further away. Up to 120° *Orthofotos* can be produced from the panoramas. In addition, these *Orthofotos* can be exported, the import of pictures into a panorama in order to close e.g. a building gap is also possible.

Due to their dissolution the panoramas are equally suitable for large prints and, after appropriate compression, for Internet. The image files are transferred into the .TIF format and burned on CD. Thus the graphic handling with conventional picture handling software and the transformation into an Internet suitable format are possible (.JPEG).



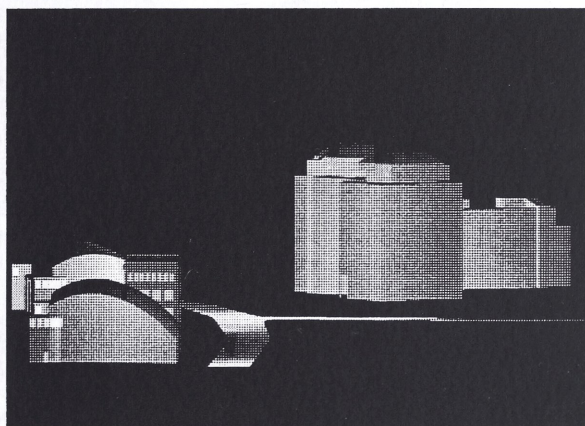
Picture 1 and 2: Gendarmenmarkt, 220° panorama and outline picture



The dissolution guarantees a sharp and very detailed playback on appropriate large canvases. The digital panoramas unfold their special attraction in presentations on large displays. With the help of picture handling software the viewer carries out the rotating motion of the camera and receives the impression of a round view.

## 2. Measured value production and CAD compatible object modelling

The grey tone panoramas entered with SASTA metric are suitable for the measured value production. With special software modules, which complete the accommodation system, frames and pairs of pictures can be analysed at the workstation. Space point coordinates and metric measured values can be determined. The linkage of pairs of pictures enables the full-scale modelling of existing objects. After transformation in the .DXF format a further processing in CAD systems is possible. Since pairs of pictures without delimitation can be taken, the modelling of complex scenarios is also possible. It applies: On all pairs of pictures visible objects can be analysed. The modelling method was applied so far in town construction and architecture, successfully for the bank modelling and the measured value production at with difficulty attainable objects (water level edge at bridge).

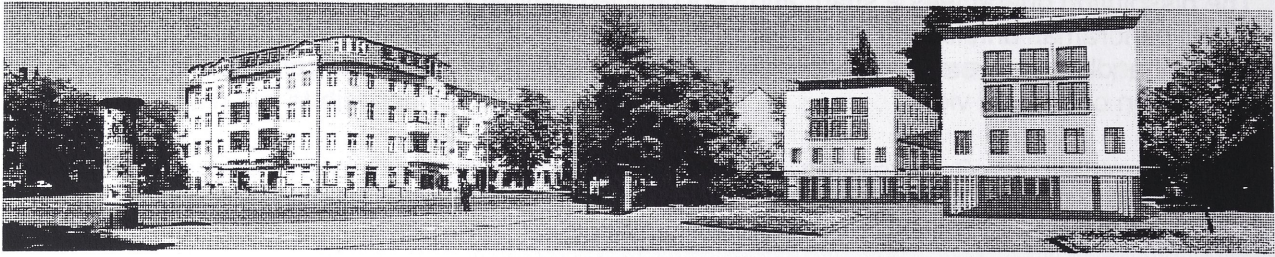


Modelling of existing buildings, Rudower Chaussee

## 3. Photo-realistic visualization

Several methods are available for visualization. These are:

- Production of object films: Object films enable the movement around modelled objects and the movement in the object. Object films are produced with the help of CAD based software.
- Production of panorama films: For the production of panorama films 360° panoramas are implemented on 3d objects. The high picture resolution and special software solutions enable the movement in a picture or a passing through of several pictures. Panorama films enable the movement by an environment and/or in objects. The representation takes place photo-realistically and the visualization results are very fast creatable.
- Connection of object and panorama films: To set objects in reference to an environment, the full-scale and perspectively correct object implementation before background information is necessary. Very high resolution surfaces, cut out from panoramas by SASTA metric technology are put in beforehand produced line models and placed as an object in an appropriate background panorama. The maximum dissolution guarantees a precise and detailed representation quality. Objects which were not yet built can be implemented in background panoramas. Thus a visualization of sketched objects is possible in the planned, really existing environment.



INNOTECH HT GmbH in cooperation with Barbara Mohren, architect

Additionally SASTA soft enables a full-scale and perspective correct implementation of 2d and 3d objects before background pictures. Thus a varying of planned objects is possible in photo-realistic quality. Additionally the technology of SASTA soft enables to create new items. The photo-realistic representation quality applies not only to even surfaces such as metal, glass and plastic, but also to porous surfaces e.g. woods.

#### 4. Data bases

For the visualization of complex scenes data bases which can administer and handle large quantities of data are necessary. Based on VRML the data base is used as navigation surface for the presentation of the visualization results in the Internet. It enables the adaptive entry of city landscapes to administer planned models and to administer data. Beside object films, animations such as picture cylinders are also representable. Furthermore the representation of detailed information to objects or to the region is possible. The data base is expandable, so that the visualization can be starting point for information systems for the promotion of economy development and marketing of a region.

A resuming development uses the virtual model as communication environment. Several users from different locations can log in over a central server and move therein. The virtual picture is completed by defined internal messages, which are fed into the model. The user is forced to react spontaneously to processes, which were released by other users. The client server development enables communication in a virtual world and animates this virtual world. The reality proximity of virtual worlds can be produced not only optically by photo-realistic modelling procedures. It is also enriched by spontaneous and defined internal messages. The technology can be used both for the simulation and monitoring of procedures. The system is tested at present by the example of a virtual driving school.