

Create Historical Perspectives with IMAGINE VirtualGIS®

White Paper

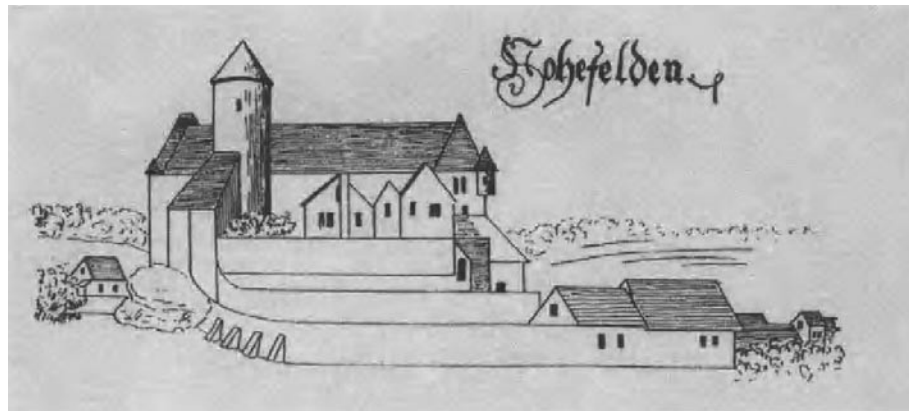
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The landscape of the village of Nohfelden in the southwestern state Saarland in Germany is dominated by the tower of an old castle complex. From a distance, this prominent landmark is easily seen.

With a modern neighborhood surrounding the tower and ruins, a physical reconstruction of the old castle is not possible. Hence the modern methods of photogrammetry and three-dimensional, computer based visualization available in IMAGINE VirtualGIS® offer an economic solution to virtually 'rebuild' this castle complex.

The engineering company, GE 0 Z Ingenieurbüro & Softwarevertrieb, won the contract to create a realistic, 3D rendering of the original castle complex in the village of Nohfelden. The goal was to present an animated visualization within an information kiosk and make that available to interested visitors of the castle. At the kiosk, visitors would interactively navigate and visualize an accurate rendering of the original castle, along with a rendering of the current conditions and neighborhood. This visual presentation of both environments in one application would enable visitors to understand more clearly what was once there and compare it to what exists today.

The basis of the work was a hand sketch of the castle by a 12 year old boy from 1788. This sketch is the only record that shows the castle complex in its original, full dimension:



Additionally a tax map from the year 1773 and an old cadastral map was available for reference. The boy's drawing and the two additional map sources were the foundation for creating this 3D historical project. The challenge was to make the virtual rebuild of the castle complex historically accurate using just these few pieces of information.

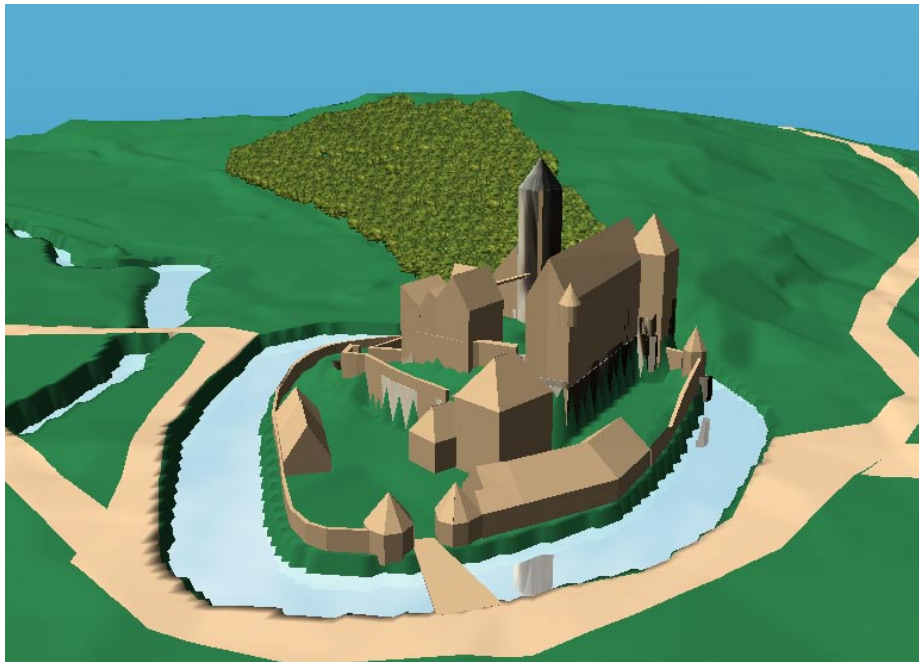
To assist in the project, additional geoproducts were created for the simulation. The company S.I.G. Schroll GmbH in Saarbruecken produced airborne images of high quality at the scale of 1:3000. From these images, the surrounding terrain, the original situation of the castle and the existing neighborhood could be derived. The model of the terrain that was extracted from these images would be the foundation for both the historical environment and also the current neighborhood. The professional photogrammetric solution, LPS was used for the georeferencing and terrain extraction the actual airborne stereo images.



Using stereo imagery from the data acquisition, both buildings and vegetation were extracted stereoscopically. These geoproducts were used to model the neighborhood that exists around the tower and ruins today.

The second step was to take the sources of historical data for the castle and lands, create sketches and georeference those to the new airborne images. Using ERDAS IMAGINE® georeferencing tools, the old castle maps and sketches were co-registered to the modern airframes.

From these referenced sketches, measurements were added and a 3D model of the castle was derived. The structure of the castle was then digitized into new georeferenced maps and sketches, and saved as shape files. These shape files were then superimposed into the stereo image pairs (generated out of LPS) with Stereo Analyst® for ERDAS IMAGINE and extended to build the three-dimensional model of the castle complex.



Starting with only an old sketch and two historical maps, the contracting company was able to use modern imagery and products, like IMAGINE VirtualGIS, LPS, ERDAS IMAGINE and Stereo Analyst for ERDAS IMAGINE. Even the fourth dimension can be visualized in the recorded movie of the animated 3D model, illustrating the castle growing out of the ground from remaining ruins of today.



In the end, the company derived a realistic, computer-rendered model of the original castle complex and created an exciting and interactive presentation for visitors of Nohfelden for years to come.