

PRECIZE 3D VIRTUAL MODEL OF CESKY KRUMLOV HISTORICAL TOWN CENTRE

Tomáš DOLANSKÝ¹, Jiří SKÁCILÍK², Jana ŠTRONEROVÁ³, Miluše DOLANSKÁ⁴

¹University of South Bohemia, Department of Informatics
Jeronýmova 10, České Budějovice, Czech Republic
tdolansky@pf.jcu.cz

²Czech Technical University in Prague, Faculty of Civil Engineering
Thákurova 7, Prague 6, Czech Republic
skacilik@fsv.cvut.cz

³CePT
Nad Nemocnicí 155, Český Krumlov, Czech Republic
stronerova@cept.cz

⁴KRAJINAK o.s. NGO
Nad Nemocnicí 155, Český Krumlov, Czech Republic
krajinak@krajinak.cz

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Abstract:

Český Krumlov is one of the most significant Czech cultural sites on the list of UNESCO, it is known for its historic center, a castle and a chateau built on a promontory of the river Vltava. With the extensive project of the NGO KRAJINAK there is a complete 3D model of the historic city center, consisting of more than 200 historic buildings. This 3D model is intended not only as a visual area display, but is also used mainly for professional planning, conservation, evaluation of development activities in the city center or for detailed archaeological research. Currently there are two models created with different levels of details – first one is a simplified version and will serve as a comprehensive overview of the city construction and will be used for large scale visualization. This first version of the model includes the shape of buildings according to the cadastral map. Individual buildings are modeled only in the basic shapes, but the usage of photos as textures makes an extremely fair view. The second more detailed version of the model contains all the details of the building facades, including decorations such as cornices, statues and ornaments. This second version is specifically used for research in the field of preservation of monuments, as well as for design studies. Besides these two models there is also research into 4D modeling, which will include the time evolution of the each building and surrounding countryside. In this 4D model, which is based primarily on the detailed 3D model, you will be able to see the face of the city center during the various periods from the early beginnings of settlement to the present form. This will all be integrated into the GIS system with information databases.

1. COMPLEX 3D MODEL

Development of a virtual 3D model of the town consists of two parallel branches. The first branch deals with the complex character of buildings where the objective is to create a large virtual 3D model of historic part of town with lower demands on the detail of the model and also with lower demands on the subsequent display in digital devices. The realization of the models is made with cooperation with the students of the Department of Computer Science University of South Bohemia who progressively create models of buildings based on available data and background images. An example from this model is shown in the following pictures. This model can be used for tourism, whether on a website or sites linking to the information system as well as a visual interface for information on specific objects. Also worth noting is the use of this model in mobile devices, which according to performed tests, smaller 3D models can already be used and is not restricted to GPS.



Figure 1: Complex 3D model

2. DETAILED MODEL

Compared to the complex model, where the buildings are very simplified, a detailed model of each building is also progressively produced. The details and accuracy of the detailed model is a high priority and the model can be used for architectural studies or procedures in the Heritage Conservation. On the facades of this model there can be spatially distinguished details and protrusions greater than 5 cm, all the cornices and decorative elements, and also hinges on doors and windows are in some cases modeled. The detailed model has a real feel and look about it that represents the town as in reality. This part of the modeling of the historic center of Český Krumlov has been made in cooperation with the students of the Department of Architecture, Faculty of Civil Engineering at Czech Technical University. The following pictures show examples from the model of the town hall, church Jost and details of the arcade on the town square of the Old Inn Hotel.



Figure 2: Detail models of Town Hall, St. Jost church and Old Inn Hotel

3. SPATIO-TEMPORAL MODEL

Both previous models are shown in the virtual form of the current appearance of the city. But the town is not a static object, and therefore KRAJINAK NGO deals with the implementation of the temporal changes in a virtual model. The first object that has been prepared is part of the Castle Český Krumlov. Over time other buildings in Český Krumlov will also receive their past appearance through old photographs, plans and drawings. The following pictures show a model of historical and current castle and chateau.

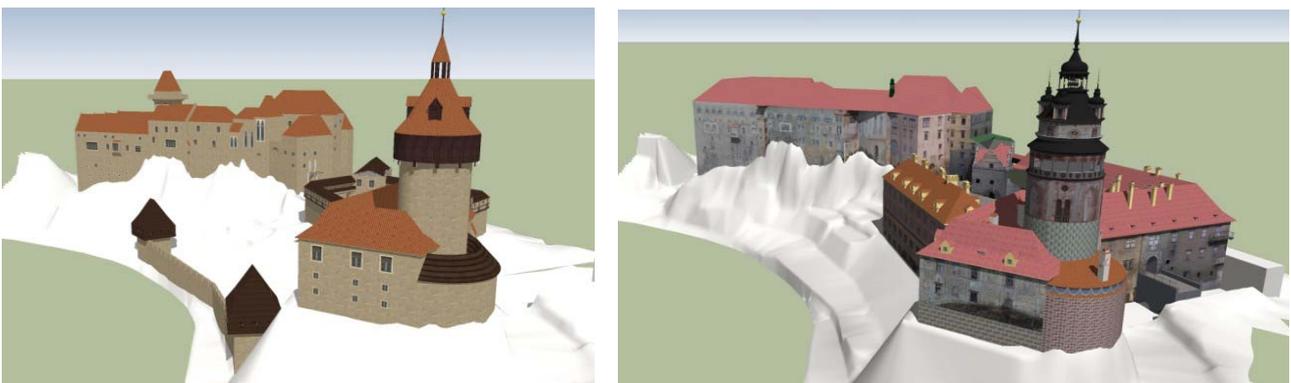


Figure 3: Historical and present 3D view of Castle in Český Krumlov

4. CONCLUSION

This project of the 3D model creation of the historic center of Český Krumlov has been on-going for several years by KRAJINAK NGO in collaboration with the University of South Bohemia in České Budějovice and with the Faculty of Civil Engineering of the Czech Technical University in Prague. The historic center of Český Krumlov has been listed as a UNESCO World Heritage Site since 1992 and is a unique cultural town for the Czech Republic and abroad. This project aims to document the current and past states of the town using the latest technology and the digital form can be used for the visualization of changes to the conservation area from the past as well as for the visualization of any future plans or changes.

This project was financed from Ministry of culture in 2008 and will continue for several years but now we are looking for new investors, for the real time implementation (of the 3D modeling) to user-friendly devices like mobile phones, tablets, netbooks and other portable devices with internet connectivity.

5. REFERENCES

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