PHOTOPA - DATABASE OF SMALL CZECH HISTORICAL MONUMENTS

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ABSTRACT:

In the Czech Republic there are many historical monuments and most of them have been documented photographically. But hardly any can be use in photogrammetry due to absence of measuring attributes. For this reason, a long-term project "Database of Historical Monuments in Czech Republic" has been started at the CTU Prague. The project objective is to create the most extensive database and to collect a photo-documentation of small historical monuments on the whole territory of the Czech Republic. The aim of the project called PhotoPa is a collection of the photo documentation, which would be sufficient for future geometric interpretation of monuments. To fill the PhotoPa system students' projects of the Photogrammetry course (80 per year), study branch Geodesy and Cartography at the Faculty of Civil Engineering in Prague, are being used. At present, over 200 monuments documented in the years 2001 and 2002 are saved in the PhotoPa system and futher will be added in summer 2003. This year we will attach previous projects carried out at the Laboratory of Photogrammetry and build-up a new server. This paper presents the development of a system based on the open source technology. First we will talk about genesis and history of the PhotoPa project, later we will focus on software used for data collection and in the end we will introduce a design of data structure for input and a proposal for Internet presentation of mentioned monuments. The PhotoPa project is carried out at the Department Mapping and Cartography of the Civil Engineering Faculty (CTU Prague) in co-operation with the Laboratory of Photogrammetry and the Laboratory of Quantitative Methods in Monument Research (Faculty of Nuclear Physics and Physical Engineering, CTU Prague).

1. THE HISTORY OF THE PROJECT

An idea to realise such a project appeared at the end of the year 2000. The aim was definite – an application of students' projects to create a database of the most threatened and unused historical monuments in the Czech Republic. Each student has to choose one object in the CR (there is a list of recommended buildings http://www.supp.cz/html/publikace/seznohrpam), the object is geodetically located by the GPS and then transformed into the Czech co-ordinate system S-JTSK; photo survey uses an elementary photogrammetry method by digital cameras and elementary geodetic methods. The project started in spring 2001. In that period the projects were processed digitally with binding regulations, nevertheless a programming conception of project and its web presentation were added after extending the project team by web specialists in autumn 2001. In summer 2001 we finished the first version of a of web system model based on 86 completed projects.In every academic year about 80 new projects from all the Czech Republic are finished. The projects are processed with development of a method, which creates XML document for every single project. Up to now about 200 objects have been documented.

2. THE REGISTRATION OF OBJECTS

The PhotoPa system consists of several sections. The first part is a web system for registration of objects. The registration has to be completed during the opening course of Photogrammetry. Every student fills in a form consisting of user's name and password, name of the project, e-mail for further communication and student's personal identification number; after completing the form every user obtains a unique ID. The registration is important for obtaining a unique ID for each student and object and it is necessary for avoiding duplications and selecting inappropriate objects (too large for a one-term project). The teacher operates the system through a web interface, which enables to send an e-mail, to accept the project, to make a list of registered objects, etc. Nowadays the PhotoPa system is launched at the server GaMa.fsv.cvut.cz (Pentium IV 2GHz, 512MB RAM) with Linux operating system, distributed by Debian Woody, the core 2.4.18 and support of PHP4 4.1.12. The web service is available on http://gama.fsv.cvut.cz/photopa. All web pages of the PhotoPa project are completely valid XHTML 1.0 Strict a standard of W3C consortium http://validator.w3.org. The second part of the project is a local application for collection thedata from students. The work of the team of authors is focused on the third part of the project – a web presentation of measured objects. The solution is developed in two options. The first one is based on programming in hitherto existing system and it is in development. The second one uses the implementation of

existing systems such as Autodesk MapGuide server version 6.0. Collected data set contains information on object position. Therefore it is possible to use GIS tools for data presentation. This part of the project was sponsored by the Autodesk Academia GIS Grant 2002 and it was a part of a diploma thesis. The application is fully functional and it is accessible on http://lfgm.fsv.cvut.cz/photopa.

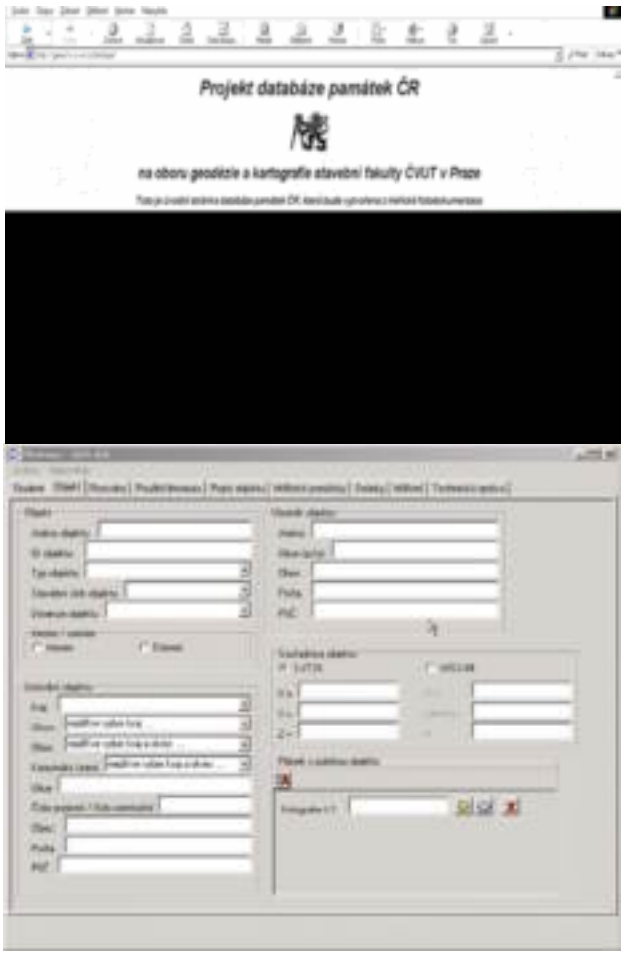

Figure 1. Input data

3. THE APPLICATION FOR DATA COLLECTION

The PhotoPa program for input of monument data is developed for structured data acquisition (text and graphics as well) about the monuments in the CR. The program is written in C++ with use of graphic library VCL. The source text compilation and link modules were created by C++Builder 6 (http://www.borland.com). The installation of the PhotoPa program is really easy. You just need to download the latest version of the PhotoPa from the PhotoPa archive http://gama.fsv.cvut.cz/~soucek/archive/photopa/. The PhotoPa, after installation, contests 4.1MB. The Uninstall function operates in a standard way. After starting the program we will see the main screen of the application. The use of other system functions is enabled via icons. The window consists of several folders: Student, Object, Analysis, Bibliography, Object Description, Measuring Tools, Photos, Measuring, Technical Report and Evaluation (teacher). These 9 respectively 10 folders contain all the necessary information about the project. The last folder appears only if the teacher evaluating the project starts the application. Information about the object is contained in the folder "Object". You can choose the following items: name, kind, tectonic style, object category, object location in administrative units (region, district, municipality, cadastral unit), object co-ordinates (in JTSK system or WGS-84), information about owner of the object (name, address,...) and map of object location (cadastral map with the object if available). Administrative units are chosen from selection generated from the database "Regional identification register UIR-ZSJ for whole republic", which is issued by the Ministry for Regional Development http://www.mmr.cz. The ID number of the object needed for registering into a web-system mustn't be omitted. It is possible to enter some further information (literature) about the object. In "Object description" you can find the object annotation (in Czech and one of foreign language). The information about the measuring tools and the used cameras is attached, too. All the entered graphical information (files) about the project can be searched through a simple graphic viewer in the program. The graphic viewer can work with several graphical formats. The Text information is entered in a HTML format. After entering the data you can save the whole project – the name of the file will be implicitly set on ID object with *.ppf – and close. It is possible to preview all the text in a web browser.

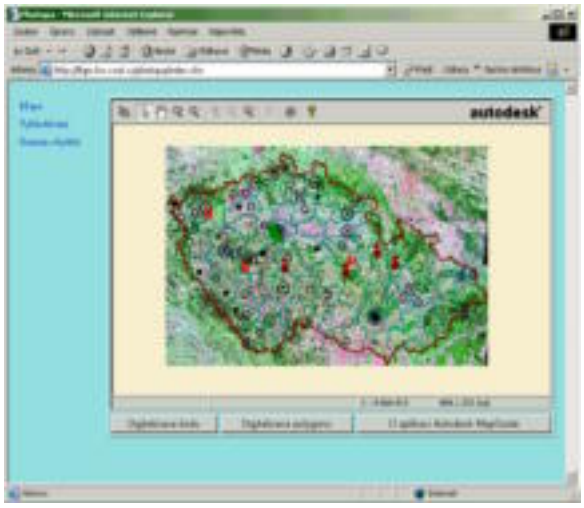

Figure 2. Work window, Autodesk MapGuide

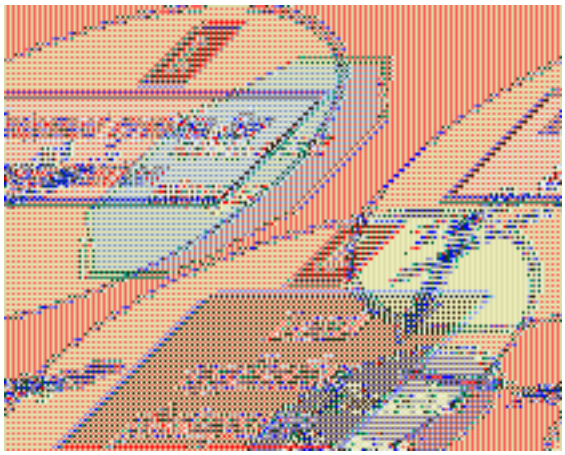

Figure 3. Scheme of PhotoPa

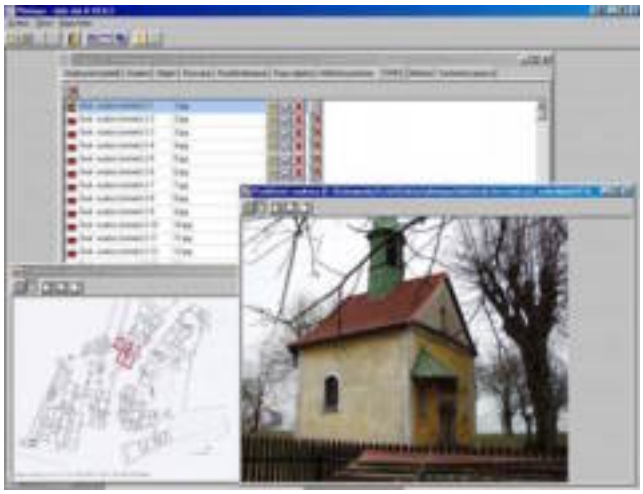

Figure 4. Screenshot of application PhotoPa

4. CONCLUSION

The work of students on historical object documentation within the Photogrammetry seminar is a big asset for keeping national heritage and culture for next generations. Many historical sights are going to ruins and disappearing from our maps in this time. Historical sights are endangered for several reasons, mostly by lack of finance, lack of interest and at last – wars, damaging or terrorism. In the Czech Republic the most limiting factor is lack of money.

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Web system PhotoPa http://gama.fsv.cvut.cz/photopa

6. ACKNOWLEDGEMENTS

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