

# Introduction to Individual Contribution by the VI Scientific and Professional Conferences with International Participation Geodesy, Cartography and Geographic Information Systems 2010

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*This contribution contains a selection of articles from 6th Scientific Conference with International Participation "Geodesy, Cartography and Geographical Information Systems 2010". Particular articles are focused on the field of geodesy, engineering surveying, mining surveying, deformation analysis, digital photogrammetry, cartography, cadastre of real estates and terrestrial laser scanning. The reader will become familiar with the recent trends and results of research that have been achieved in these areas at universities, as well as in the commercial sector that act in branch of geodesy in the Czech and Slovak Republic.*

**Key words:** *geodesy, cartography, geographical information systems, photogrammetry, geodetic network, processing of measurements, mining surveying, terrestrial laser scanning.*

## Introduction

The very name, it is clear that already the sixth annual conference, the broad interdisciplinary nature in order to present new knowledge in theory and practice. Was aimed at the general issue of current geodesy, mine surveying, cartography, cadastre, the deformation of the investigation, photogrammetry, laser scanning and geographic information systems.

Due to the broad interdisciplinary image the individual thematic units divided into three areas:

### 1. Geodesy, cartography and mine surveying

- Legislation, organization and education in the field of geodesy, cartography and mine surveying,
- Methods, techniques and geodetic survey devices,
- Cartographic aspects of surveying and mine surveying,
- Digital Cartography,
- Geodynamics, engineering geodesy, deformation analysis and other aspects applied in geodesy, mine surveying, and underground surveying,
- Satellite, Space and Astronomical Surveying,
- Adjustment calculus and adjustment of geodetic networks,
- Photogrammetry.

### 2. Geographic Information Systems (GIS)

- History and current trends in GIS,
- Models and data structures,
- 3D visualization of spatial data,
- Planning and design of GIS technology.

### 3. Cadastre of real estates

- Legislation, organization and current issues in cadastre of real estates,
- Cadastral base and cadastral systems,
- 3D cadastre - the use of perspective,
- Applications cadastral data.

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### Some comments on the collection of contributions

The first contribution in the field of land surveying "**Putting cadastral map more precisely**" [1] responds on ongoing digitization of cadastral maps in the Czech Republic, which aims to restore without a new cadastral mapping content with constructing converting analogy to digital cadastral map statement in the prescribed form and data structures. A substantial part of the paper is devoted to an alternative solution sketches.

In the field of cartography has been selected three contributions, the first "**Thematic cartography and databases visualization**" [2] discusses the development of the Landscape Atlas of the Czech Republic where it was necessary to deal with a lot of cartographic problems arising from the need for professional design of spatial databases to analogy thematic cartographic work. Printed copy of the Landscape Atlas of Czech Republic aroused great interest. It is interesting to indicate that this impressive cartographic work on the dimensions of 50x61 cm and weighing about 9 kg in 1300 contains maps and map cropped to 382 pages, it worked on over 300 professionals for six years and costs amounted to 55 million CZK. The selling price will be around 4500 CZK.

Methodology for assessing the accuracy of topography and cartographic methods of research deals with the article "**Cartometric analysis of planimetric accuracy of topographic maps 1:100 000 created in S-46 coordinate system**" [3]. The modern methods of cartometric analysis discussed paper "**Mathematical Approaches to Evaluation of Cartometric Analysis of Contents of Old Maps**" [8].

Photogrammetric documentation of objects located on of the undermined area is an important documentary value in the study of their current status and dynamics phenomena in undermined. Measurement results can be used not only for building-historical and technical research, but also as a basis for their reconstruction, or for promotional purposes. This issue is dealing with the authors of the article "**Potential Utilization of Photogrammetry to Observe Properties on Undermining Territory**" [4]. Photogrammetric monitoring G - shaft undermined the effects of wall coal face and the application of the results of the measured values are essential to make binding decisions on liquidation or a natural left G – shafts Baňa Nováky plant. Discusses the contribution of "**Photogrammetric observation of the vertical mining shaft**" [6].

Archaeological discoveries as part of our cultural heritage should be given due attention, document and preserve their way corresponding to their age and inestimable value. Contribution of "**Application of digital photogrammetry in the process of documentation of archaeological artifacts**" [14] shows that given the effectiveness of digital photogrammetry to collect spatial data in the process of documentation of archaeological artefacts. Analyzes and evaluates methods for convergent photography and photo-scanning in data processing.

The article "**Indirect Distance Measuring as Applied upon both Connecting Surveys and Orientation One**" [5] proposed an innovative method of connecting and orientation measurement using indirect measurement lengths using electro-optical distance meter, which belongs to the mine surveying.

The area of deformation is represented by the survey in three discussed. Contribution "**Monitoring of rock blocks movement**" [7] is devoted to tracking shifts and rotations rocks in the Moravian Karst.

Use of GNSS for the needs of the deformation of the investigation has proved very useful, whatever the season, time of measurement and the main benefit is eliminating the need line of sight between points, but replaced by a need for adequate reception of GNSS signals from satellites. The results of these measurements tell us about the authors of the article "**Deformational analysis of Dargovských hrdin housing estate by global navigation satellite systems**" [12]. The surveying of two underground gas storage facilities in order to determine any distortions or changes in position exposed parts of objects that may be caused by change in volume of compressed gas, liquefied gas level and temperature changes that may eventually affect the tank wall deformation or strain of the plastic material and technological devices inform article "**Deformation measurement of underground gas reservoirs**" [11].

In the field of engineering geodesy were presented at a conference two contributions. The first of these "**Using technology of TLS by the measuring of real situation block's of flats Vlčince II in Žilina**" [9] deals with the possibility of using terrestrial laser scanning technology in construction and related fields. The advantage is not only fast comprehensive orientation of objects and the surrounding terrain, but also easy processing of measured data and the resulting visualization to 3D models. The article "**Creation of surveying base for rebuilding project of ice rink**" [10] evaluates surveying the needs of existing documentation and verification for the project of reconstruction of the Ondrej Nepela ice rink in Bratislava.

Very important role in the land records of ownership of immovable property and keeping the documentation to them. Article "**Legislative changes in the Department of Geodesy, Cartography and Real Estate Register after 01.09.2009**" [13] provides a comprehensive image of the legislative changes in the cadastre branch after 1.9.2009.

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