

**Piotr Bugiel: An elementary derivation of Knothe's formula concerning subsidence of a point under the influence of exploitation • Geodezja • Tom 11 • Zeszyt 2 • 2005**

The well known S. Knothe's formula on the subsidence of a single point of a non-stationary subsidence trough under the influence of exploitation is derived in an elementary way. An important role plays the interpretation of non-stationary subsidence trough as rheonomous constraints. Such an approach reveals some paradoxical property of the instantaneous troughs, namely they all attain practically the very same maximal subsidence.

**Keywords:** subsidence trough, rheonomous constraints

**Elżbieta Jasińska, Edward Preweda: The application of factorial analysis in the classification of the attributes of real estates • Geodezja • Tom 11 • Zeszyt 2 • 2005**

When asking about the estimation of the market value of real estates it is very important to define the influence of respective attributes of real estates on their prices. The features of real estates are usually correlated one with another. High correlation between the explaining attributes shows that they explain the same part of the variability of prices, thus from practical and economic point of view, the attributes bringing similar information should be eliminated. To establish the influence of the attributes on the prices of real estates, factorial analysis was applied. Its main application is the reduction of the number of variables and detection of structure in the relationships between variables, i.e. classification of variables. Among several methods of factorial analysis the method of main components was chosen. This method allows the selection of the number of factors by the expert in evaluation of real estate. In the analysis of main components, after selecting the first factor one can define subsequent ones, which maximize the remaining variability. Since every following factor is defined in such a way that the variability not covered by the previous ones could be maximized, subsequent factors are independent from one another. It is a subjective decision to establish a number of selected factors and methods of their selection. Among the most often applied statistical methods, in the paper the Kaiser criterion and talus test were used.

**Keywords:** evaluation of real estates, factorial analysis

**Anna Barańska: Estimation of parameters of non-linear function models for real estate market value prediction • Geodezja • Tom 11 • Zeszyt 2 • 2005**

The basis of modelling real estate unit values is information on prices and qualities of real estates as subject of market turnover or on market values of representative real estates and their attributes. Such a data set constitutes a representative basis of real estates for analysing the market, meeting all criteria of multidimensional random variable.

Among different non-linear functions of many variables, in modelling of a real estate unit price or value, multiplicative exponential function is chosen to be examined in relation to the particular attribu-

tes. Exponential form of the function assures positive values of real estates and it permits to describe their variability as a monotone function.

The model of real estates unit values in form of multiplicative exponential function was analysed as follow

$$c = B_0 \cdot B_1^{x_1} \cdot B_2^{x_2} \dots B_m^{x_m},$$

where:

$c$  – real estate unit price or unit value,

$x_1, x_2, \dots, x_m$  – real estate attributes, including the attribute of “transaction time”,

$B_j$  – estimated model factors,

$B_0$  – real estate unit value, for zero of all attributes.

Estimation of model parameters may be done in many ways. In the present paper, the run system for Markow method (in form of least squares weighing method) will be submitted.

Verification of estimated model proceeds as follows:

1. investigation of model acceptability regarding the values of factors variability as well as the convergence,
2. analysis of model factors significance,
3. analysis of random components symmetry.

**Keywords:** market value, multiplicative model, estimation methods, verification of model

#### Jarosław Bydłoz: **Data transfer standards problem in the aspect of cadastral information range** • Geodezja • Tom 11 • Zeszyt 2 • 2005

The standards of data transfer from the cadastral system are the subject of this paper. Legal basis, technical instructions and purposes of data transfer from the cadastral system are described in the first part of the paper. In the following, the most popular standards are presented. There are DXF, SWDE and two standards based on XML computer language (GML and LandXML). DXF, GML and LandXML are international standards, SWDE is the polish standard. Two cadastral objects (parcel and building) are created in the computer program Ewmapa and transferred to both DXF and SWDE standards, for better illustration of analysed problem. Evaluation of these standards and possibilities of further application in cadastral data transfer have been also made in the paper.

**Keywords:** data transfer standard, ground and building cadastre, DXF, GML, LandXML, SWDE

#### Paweł Hanus: **Comparison of data contained in IACS in the relation to the cadastre system** • Geodezja • Tom 11 • Zeszyt 2 • 2005

In the paper a problem of using data, contained in cadastre, for the needs of creating data necessary for IACS application in Poland, has been showed. The problem has become especially important after Poland accession to the European Union. Shortly described essential rules of cadastre system and also the ultimate range of grounds data, which are the base for direct determining amount additional payments for agricultural production. It has been stated, that data contained in cadastre are completely sufficient for the aims demanded for IACS system. Comparing data contained in IACS system, one must state, that data referring to the parcel boundaries, do not yield data coming from the cadastre, and moreover they fulfil suitable criteria showed in relevant regulations. However, they are more update then cadastre data. So, one should use them, in cadastre modernisation proces.

**Keywords:** cadastre, IACS, cadastre accuracy data

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Paweł Hanus, Krzysztof Kremiec: **Cadastral maps transformation of former Austrian annexation** • Geodezja • Tom 11 • Zeszyt 2 • 2005

Cadastral maps of former Austrian annexation are also used nowadays for various surveying works. These maps are applied, first of all, for the needs of grounds and buildings register (real estate cadastre) modernisation. It is necessary, for performing this process, to create cadastral numerical map, with spatial data gathering by means of direct method. Taking into consideration various reasons, including economical ones, such map may also be created on the base of former cadastral maps, through vectorization process, together with expanding their contents of additional data, coming from surveying reports such as: real estate delimitations, subdivisions, assemblages and condemnations. Numerical map creating on the base of former cadastral map, demands scanning process of such map and then using transformation of raster map to the suitable reference coordinate frame. This problem has been presented in the paper from theoretical point of view, with an example of transformation, made for Trzebinia city, and with errors analysis.

**Keywords:** cadastre, transformation

Józef Jachimski, Sławomir Mikrut, Mariusz Twardowski: **The methodology of the use of data base of the Multilingual Interdisciplinary Dictionary and Glossary of Terms for Geoinformatics of The Polish Academy of Arts and Sciences** • Geodezja • Tom 11 • Zeszyt 2 • 2005

The fast development of computer science oriented on capturing, processing and distribution of geoinformation (geoinformatics), which has applications in many technical and natural disciplines of science and technique, calls for urgent unification of professional terminology – for terminological dictionary. The presented open formulae computer program for creation of dictionary assumes the use of internet to continuously present the content of the dictionary database. That way the dictionary is available for users, even during the editorial activity, when it is not completed yet. The open formulae assumes also participation of volunteers in the editorial work via discussion over the existing entries and definitions, as well as via proposing their contributions to the dictionary contents. The project was initialized and is organized by the Geoinformatics Commission of The Polish Academy of Arts and Sciences in Krakow. The dictionary program was prepared by, and dictionary data base is installed on the server of the Department of Photogrammetry and remote sensing informatics. The experimental of pertaining computer program is ready for use in the internet.

**Keywords:** terminology, geoinformatics, photogrammetry, remote sensing, internet, Polish Academy of Arts and Sciences

Elżbieta Jasińska, Edward Preweda, Jan Ruchel: **The analysis of the real estates market in Krakow, compared to selected countries of the European Union** • Geodezja • Tom 11 • Zeszyt 2 • 2005

In the paper the situation of the Polish market of real estates was presented and compared with other countries of the European Union. Average prices of real estates in respective countries were defined, the analysis of price differences between capitals was made, the size of cities was taken into account, and the growth of the number of transactions before and after the accession was presented. The problem of purchasing land by foreigners was shown. The main focus was on the analysis of the Krakow market of real estates, regarding its advantages, disadvantages, and development of the city and development of economy, market of apartments, not built-up land, office surfaces and commercial space.

**Keywords:** Analysis of the real estates market, European Union, integration

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Maria Żukowska: **Some chosen methods of cartographic visualisation** • Geodezja • Tom 11 • Zeszyt 2 • 2005

Among many various cartographic visualization methods thematic maps are definitely standing out. One of them are cartogrammic mapping techniques, which are used to depict statistical surface with areal signs. Some phenomenon average intensity in spatial units boundaries they show. Two cartogrammic mapping techniques: choropleth and dasymetric mapping in the paper are discussed. Using cartogrammic methods numerical values either in discrete or continuous manner is shown. Usually cartogrammic techniques are used to present relative values, what is a simple consequence of being presented in reference to spatial units boundaries. In the paper the fact, that diversified reference units size can lead to distorted map perception is mentioned, what makes the reference units choice as one of the most essential problems. Apart from that some other problems that can influence the choropleth maps creation correctness are shown, among them rating ranges and color scale choosing. In the paper some analytic, graphic and iterative range constructing methods are presented. Also some choropleth mapping disadvantages are discussed, which the dasymetric mapping is decreasing. Several dasymetric techniques are described as well. Treating dasymetric method as one of the areal interpolation problems, especially in American literature, is mentioned.

**Keywords:** dasymetric mapping, choropleth mapping, cartographic visualization methods

Marta Kosecka, Regina Tokarczyk: **Proposal of the low cost and effective photogrammetric method tact polish country monuments documentation with digital cameras** • Geodezja • Tom 11 • Zeszyt 2 • 2005

A cheap and simple method of terrain measurements and elaboration of measurement results described in this paper gives possibilities of photogrammetric recording of historical objects located at Polish countryside. It is based on the usage of calibrated amateur digital cameras. This method doesn't require any skills in shooting stereoisimages, therefore, in further elaborations, the equipment for 3D observations and measurements is not needed. The proposed technology was tested by performing 3D photogrammetric restitution of an ancient wooden mill in Raciborowice, near Cracow. For further measuring images, camera calibration, calculation and bundle adjustment, construction 3D model filled by raster images, the Orpheus software was used.

**Keywords:** architectural photogrammetry, digital compact camera, photorealistic virtual model

Jacek Kudrys: **Radio interference observed in GPS signal measurements** • Geodezja • Tom 11 • Zeszyt 2 • 2005

In the paper the GPS signal jamming inducted by remote TV camera is shown. Based on GPS observations, the signal analysis using teqc software, and baseline solution are conducted. Analysis are compared with observations made in case of no GPS signal jamming.

**Keywords:** radio interference, GPS signal jamming

Jacek Kudrys: **PTK GPS corrections transmission using Ntrip protocol** • Geodezja • Tom 11 • Zeszyt 2 • 2005

In the paper the results of RTK GPS measurements utilizing Ntrip protocol are shown. Zero baseline measurements with serial cable communication between base and rover receiver and made with AGH's Ntrip Broadcaster are analyzed. Moreover, the measurements made on 17 m baseline with AGH's Ntrip Broadcaster and BKG's Ntrip Broadcaster are compared.

**Keywords:** Ntrip internet protocol, RTK GPS measurements

**Grzegorz Lenda: Tests of fitting quality of the spline functions to the real objects shapes** • Geodezja • Tom 11 • Zeszyt 2 • 2005

This article was devoted to the tests which allow to rate practical usability of spline functions in wide range shape describing process. There were proposed effective criterions, which allow to rate quality of splines arc to approximated object convergence. Those tests were performed for especially created simple models, which can be easily compared with any measured shape. By then it become possible to sum up the deformations arised from the spline functions describing techniques. The Investigations results ale especially useful for measuring points schedule planning, that way to let the curve or surface consists of them to be precisely fitted to the real measured object shapes.

**Keywords:** spline functions, interpolation, approximation

**Anna Przewięźlikowska: Comparison of the functioning of the German cadastre to Polish conditions** • Geodezja • Tom 11 • Zeszyt 2 • 2005

The article contains an analysis which allows selecting German federal states with the cadastre system functioning most similarly to the cadastre system in Poland. To achieve this goal the author presents the results of an evaluation of the status of the cadastre system in all sixteen federal states as well as Poland and a comparison of the functioning of the system in individual federal states and Poland.

The evaluation and comparison have been conducted in seven predefined categories, on the basis of point weights. As the result of the research two metagroups of attributes have been defined: one comprising the categories in which it is hard to introduce quick changes (general data, organization of the cadastre system, contents of cadastre) and the other the categories in which it is easier to introduce changes (data quality, information flows, informatization level, cadastre usability). On this basis the so called "Best cadastre examples for Poland" have been identified, meaning federal states with relatively high evaluations of the cadastre systems and similar characteristic to the cadastre system in Poland. The identified states are North Rhine-Westphalia, Lower Saxony and Free State of Bavaria.

**Keywords:** cadastre, cadastre comparison

**Zofia Śmiałowska-Uberman: Selected issues in Polish land-surveying resulting from the EU integration** • Geodezja • Tom 11 • Zeszyt 2 • 2005

The author intents to publish several articles aimed at a complex presentation of impact of the EU integration including the EU law adoption on the Polish national law, and then, of professional and academic issues in land-surveying and cartography resulting from the EU law. The hereby presented publication is the first one belonging to the planned series. It brings a historical outline of EU integration, present EU institutions, Polish road to the accession and main international activities of the Chief Gheodesy and Cartography Office.

The following tables have been prepared:

- the one containing base knowledge in area of pillar co-operation structure of member countries within a frame of binding treaties;
- the one presenting main and supporting EU institutions, their composition, tasks and functions;
- the one explaining the misleading naming of EU councils.

**Keywords:** general idea of the European integration, Treaty of European Union, structure of EU Institutions, Poland in EU, the Polish geodesy in EU

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Marian Sołtys: **Methods for underground utility depth determination using various locators** • Geodezja • Tom 11 • Zeszyt 2 • 2005

The paper presents methods for determination of depth of underground metallic and nonmetallic utilities, using multifunctional electronic locators and additional accessories, like electromagnetic markers, location tapes and transmitting probes. Results of practical experiments are discussed. An accuracy assessment of automatic depth surveys using modern locators are given. The range and accuracy of utility depth determination with chosen locators, markers and probes are presented.

**Keywords:** electromagnetic locator, underground utility, transmitting probe, electromagnetic marker

Andrzej Uznański: **Application of the Autodesk Land Solutions software package to elaboration of RTK GPS projects** • Geodezja • Tom 11 • Zeszyt 2 • 2005

The paper presents selected possibilities of use of the Leica SR530 GPS receivers, furnished with optional engineering application programs, in realization of surveying tasks. Actually available firmware options are described and possibilities of cooperation of the SR530 receivers with the Autodesk Land Solutions package in effective processing of survey data are discussed. Package applications are presented in short, with stress on cooperation in processing of RTK GPS data, and on preparation of data for setting-out with this technique.

**Keywords:** Real Time Kinematic Surveys, software SR530 GPS receiver, Autodesk Land Solutions

Maria Żukowska: **The objective curve simplifying method and the topological inconsistencies** • Geodezja • Tom 11 • Zeszyt 2 • 2005

Existing global curve simplifying algorithms, such as Douglas–Peucker algorithm or Chrobak method, despite many advantages, not free from topological inconsistencies are. These point – point, point – line and line – line collisions (where line – line collisions can into selfintersections or intersections of at least two separate curves divided be) could be. There also a problem connected with some elements relative position changing is. Some propositions, that at such inconsistencies solving drive, examined in this paper are. Among them original curve partitioning into segments and star-shaped regions, which would independently simplified be (which selfintersections avoiding enables in turn), and relative position changing investigating with a triangle built of examined segment chord and its relative extremum (like the one in the Chrobak simplifying method used), are.

**Keywords:** Chrobak method, Douglas–Peucker algorithm, topological inconsistencies, curve simplifying.