Tomasz Adamczyk: **Application of the Huber and Hampel M-estimation in Real Estate Value Modeling** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

Mathematical statistics is a powerful tool in real estate analysing and its valuation, when large databases are to be considered. The professional literature very often cites two or multidimensional variables methods of regression. Typically the model parameters estimation is based on the smallest squares method, however, such a method could not be resilient to the outlier cases. Even a single outlier could potentially have a negative impact on estimating results obtained by using the standard smallest squares method.

The author analyzes the possibility of application of the chosen robust estimation method in property value modeling – the Huber and Hampel method. Comparing to the most commonly used classic estimation method, the robust estimation method enables us to obtain the smallest variation values for the estimated parameters, that results in property value estimated parameters variance minimizing, based on a given model.

To verify the rationale of using the resilience methods in property valuation assumption, a sample of real property database analysis was conducted. The findings were concluded based on result comparison of the classic smallest squares method and the robust estimation method (Huber and Hampel) with variance analysis being also taken as a basis for conclusion.

Keywords: M-estimation, outliers, property value modeling

Olena Dan, Elena Neverova-Dziopak, Eleonora Butenko, Alexey Kapustin: **Analysis of Mariupol Metallurgical Enterprises Influence on Ecological State of Surface Waters** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

This paper deals with the problem of environmental impact of metallurgical enterprises on ecological state and water quality of the Kalchyk and Kalmius rivers and the coastal zone of the Sea of Azov (Ukraine). These metallurgical enterprises Azovstal Iron & Steel Works and Ilyich Iron and Steel Works are situated in

Mariupol city within the catchment area of the examined water bodies.

Keywords: metallurgy, surface water, wastewater, water pollution index

Agnieszka Dawidowicz, Anna Klimach: **The Development of Local Land Information Systems in the Rural Municipalities** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

Nowadays Land Information System (LIS) is the part of a developing society. These systems build relationships between the institutions. The use of land information systems affects the innovative capacity in both urban and rural areas. They can be also used in creating web mapping services for different levels of country division.

This paper presents practices in the establishment of the local web mapping services using LIS data in rural communes. It also presents opportunities and directions for use of the Land Information Systems.

Keywords: Land Information System (LIS), web mapping services, rural commune.

Małgorzata Krówczyńska, Ewa Wilk, Piotr Pabjanek, Marlena Kycko: **The Determinations of Features and Wavelength Relevant for the Discrimination of Asbestos-Cement Roofing** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

Asbestos-containing products are harmful to human health, and therefore their usage and production was banned in 55 countries, including the EU. Since asbestos-cement roofing accounts for 90% of asbestos used in the world today, an important issue is to use remote sensing data for asbestos identification and mapping. The objective of this study was to determine the possibilities of discrimination of asbestos-cement roofing (ACR) from other roof coverings, based on spectral signatures, and to select the most appropriate wavelengths for classification purposes. Spectral signatures were measured under laboratory conditions for 43 types of roof coverings typical of buildings in Poland with the use of ASD FieldSpec 3 (350–2500 nm). Roofing coverings were varied as to the composition material (metal sheet, ceramic, cement, asbestos-cement, roofing felt), coating (enamelled, lacquered, matt, clayed, polyester), colour, and shape (corrugated, flat). Samples of asbestos-cement roofing were collected during field visits and others were acquired from distributors of building construction

materials. An analysis of spectral signatures indicates that there is a possibility of discrimination of ACR from other roof coverings. The optimal wavelengths determined were 410, 550, 670, 740, 870, 990, 1310, 1700, 1840, 2130, 2200, and 2270 nm.

Keywords: asbestos, asbestos discrimination, hyperspectral data, spectral curve, asbestos roofing

Ewelina Kwiatek: **Evaluation of Multilingual Land Surveying Dictionaries – Part II** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

Multilingual specialised dictionaries may be divided according to different criteria, e.g. the number of languages (bilingual vs multilingual dictionaries), data presentation (visual vs. text dictionaries) or medium on which the dictionary is published (printed vs. electronic dictionaries).

As it has already been mentioned in the first part of this paper [6], based on the medium criterion dictionaries may be divided into traditional printed dictionaries, electronic dictionaries compiled by publishing houses and research/academic institutions and other Internet dictionaries. Traditional dictionaries have already been discussed in the first part of this article [6]. This part of the paper examines different types of electronic dictionaries from the perspective of different users: land surveyors, students of land surveying and related fields, translators and technical writers. It particularly focuses on such dictionary features as language combinations, number of entries, data categories, layout, accessibility and availability on the market.

Keywords: electronic dictionaries, on-line dictionaries, language for specific purposes (LSP), surveying, land surveying

Monika Mika: **Analysis of Data Consistency Between Land and Buildings Registry and Land and Mortgage Register in order to Create Real Estate Cadastre** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

The object of this study is to investigate the mutual relationship between Land and Mortgage Registers System (KW) and Land and Buildings Registry (EGiB), which acts as a real estate cadastre in Poland (KN). KW is a system recording data of a legal nature relating to real estate, EGiB is a system recording actual data concerning a plot. Data from the both systems constitute a cadastral information. These institutions are managed by separate authorities and have different territorial ranges.

EGiB concentrates within the district, while KW is managed by the district courts. The region of influence of the local district court does not coincide with the district area. The scope of the analysis includes both subjective and objective data for a randomly chosen group of real estates. The study area overlaps with the area of influence of the District Court Department of Land and Mortgage Registers in Stalowa Wola and District Office in the same town. The evaluation of the flow of spatial and legal information between EGiB and KW systems was made in the scope of the objects leading in both systems. The leading object in the EGiB system is a plot of land, while the leading object in the KW system is a land property in terms of Land and Mortgage Registers.

The analysis of the flow of information between the two systems revealed a number of significant errors. The author verifies them and is seeking ways to solutions of the problem.

Keywords: real-estate cadastre, cadastral information, the flow of information, registry of land and buildings, mortgage registers

Monika Siejka, Katarzyna Matkowska: **The Use of Local Property Markets Analyses in the Preparation of the Evaluation of Land in Consolidation and Exchange** • Geomatics and Environmental Engineering 2017, Vol. 11, No. 1

The development of the real estate market in the sector of agricultural land is due to the growing interest of investors, who can be classified in two groups. The first group form farmers purchasing agricultural land for the farming business purposes and in the second group there are other investors who consider that the relatively cheap land constitutes a good capital investment. Therefore, the owners of agricultural property expect, that actions taken in the processes of consolidation and exchange of land will be taking into account in their assumptions market values of these properties determined on the basis of transaction prices of agricultural land.

The research undertaken in the work, conducted in the Brzozów district area clearly show, that variability in transaction prices is caused mainly by location understood as the distance from the main administrative centers – municipal or district ones. While the production value of arable land is a feature that affects the variability of prices, but to a much lesser extent. Therefore, the use of transaction prices for the valuation of land for the needs of consolidation and exchange of land is justified.

This solution will simplify the mutual settlements between the land consolidation participants; will allow the land transactions in the process of consolidation, and will affect the accuracy of determining the value of land owned by the consolidation participants. In addition, the use of transaction prices to estimate the value of the land covered by the consolidation process will authenticate the valuation process, which is particularly important in contested cases.

Keywords: the estimated value of land, land consolidation, transaction price