

Radosław Cellmer, Adam Senetra, Agnieszka Szczepańska:
Land Value Maps of Naturally Valuable Areas • Geomatics and
Environmental Engineering 2012, Vol. 6, No. 3

The objective of this study was to analyze the correlations between environmental quality and property prices. The resulting data were input to develop land value maps with the use of cokriging methods. The key environmental factors affecting property prices were greenery, surface water, noise impacts and landscape features. The assessment method was point valuation, and environmental quality was a variable in statistical analyses. The surveyed site was undeveloped land plots in the suburbia of Olsztyn, the capital city of the Region of Warmia and Mazury in Poland. The applied methodology is based mostly on the modeling of spatial correlations with the involvement of statistical and geostatistical techniques. The results are presented as models of selected correlations and thematic maps illustrating the effect of environmental factors on property value.

Keywords: environment, geostatistics, landscape, property prices, value map

Paweł Cwiąkała, Tomasz Owerko: **Determination the Accuracy of TELPOD SVP 45 Resistive Sensors as Tools for Measuring the Relative Displacement of Points** • Geomatics and Environmental Engineering 2012, Vol. 6, No. 3

Modern measurement technologies allow us to simplify the carrying out of surveys, especially specialist ones. Resistive sensors may prove to be useful during measurements of deformations and strains of structures. These tools allow for the surveying of changes in section lengths and the spacing of expansion gaps. The article will discuss the sensor calibration procedure. In addition, a statistical analysis of the test measurement results of eight sensors of this type will be discussed.

Keywords: resistive sensors, accuracy, deformation measurements

Wojciech Kocot: **An Analysis of the Causes of Damage to Reinforced a Concrete Road Viaduct Located in the Mining Area**

• Geomatics and Environmental Engineering 2012, Vol. 6, No. 3

This article discusses the causes of the damage to a road viaduct localized in a mining area. Due to the location of the structure, it was suspected that the damage resulted from impacts associated with mining exploitation. An analysis demonstrated no causal relationship between the occurring damage and the mining exploitation in the viaduct area, as well as probable causes of damage were identified.

Keywords: viaduct, impacts of mining, mining damage, pseudo mining damage

Katarzyna Nosek, Katarzyna Styszko, Janusz Gołaś: **Determination of Acidic Pharmaceuticals in Municipal Wastewater by Using Solid-Phase Extraction Followed by Gas Chromatography-Mass Spectrometry** • Geomatics and Environmental Engineering 2012, Vol. 6, No. 3

The appearance of pharmaceutical compounds and the need of their determination in an aquatic environment has become a subject of growing concern over recent years.

This paper describes an application of a quantitative analytical method for the determination of selected nonsteroidal anti-inflammatory drugs: ketoprofen, naproxen, diclofenac and other newly emerging contaminants – triclosan and bisphenol A in influent and effluent from a wastewater treatment plant located in Krakow (Poland). Samples were isolated and preconcentrated by using the solid – phase extraction (SPE) technique, then eluat was derivatized with N-methy-N-(trimethylsilyl)-trifluoroacetamide (MSTFA) and analyzed by gas chromatography coupled with mass spectrometry. All of tested pharmaceuticals were present in the wastewater treatment plant effluent and influent at concentration ppt to ppb.

Keywords: pharmaceuticals, wastewater, GC/MS, solid-phase extraction, derivatization

Elżbieta Pastucha: **Research on the Influence of the Approximated Principal Distance on the Accuracy of Orthophotoplans Out of Historic Polychrome (on Flat and Quasi-Flat Surface)** • Geomatics and Environmental Engineering 2012, Vol. 6, No. 3

This article discusses the problem of errors caused by the variability of principal distance in creating orthophotoplans of

historic polychrome. Photographs used in the process of orthorectification need to have stable and known interior orientation elements, and photographs used in heritage documentation have to achieve the highest possible visual quality (including sharpness). The highest possible sharpness, provided by the variability of principal distance, and the stability of interior orientation elements are conditions which mutually exclude themselves. Analytical studies were conducted to calculate errors that would occur on resultant orthophotoplans if in the process of computing photographs (taken in autofocus mode) would take part IO elements established for average distance from the object plane. The analysis is based on the assumptions similar to the conditions found in historic sites. Three types of lenses (20 mm, 50 mm and 150 mm) were taken into consideration, two resolutions (0.3 mm and 1 mm) of final orthophotoplans. Neither the scale of adjoining photographs should be different more than $\pm 10\%$ nor the error caused by the variability of principal distance exceed 0.25 pixel. There were two types of objects adopted for the analysis: polychrome on the flat wall and the stone wall. Conducted studies showed a relatively small influence of approximated principal distance on geometrical accuracy (radial shifts) of resultant orthophotoplans.

Keywords: heritage documentation, orthophotoplan, interior orientation elements, DSLR camera

Martyna Poreba, François Goulette: **Assessing the Accuracy of Land-Based Mobile Laser Scanning Data** • Geomatics and Environmental Engineering 2012, Vol. 6, No. 3

The quality of collected point cloud is an important matter to make possible their effective use. However, studies concerning the qualification of data obtained from mobile laser scanners are not numerous. For purposes of point clouds analysis, it is possible to define several criteria which provide information about their quality.

A synthetic overview of the state of knowledge regarding accuracy assessment is presented in this paper. Afterwards, a methodology adapted to mobile mapping systems evaluation is proposed. The study was aimed to validate received data in terms of accuracy, rather than assess the individual components of the system. The evaluation was conducted in two ways. In the first one, it was achieved through integration with other data sources such as high resolution point clouds from static terrestrial laser scanning as a reference. As a result, an average distance

of 0.185 m in relation to the reference cloud was obtained. On the other hand, a classical Total Station survey of points on building façade was made. Afterwards, length of various combinations of sections were compared with corresponding sections in mobile point cloud. Finally, assumptions made for both methodologies, their limitations and the experimental results obtained are briefly discussed.

Keywords: accuracy, laser scanning, Iterative Closest Point (ICP), point cloud, reference data

Janusz Rusek: **Computational Intelligence Methods in the Problem of Modelling Technical Wear of Buildings in Mining Areas** • Geomatics and Environmental Engineering 2012, Vol. 6, No. 3

In the work presented approach with a view to building the model of degree of technical wear of buildings in the mining areas, as well as an indication that the contribution of the consumption on technical factors interact mining and civil construction origin. Set out criteria for the selection and research methodology effects are synthetically summarised existing work in this field. Justified choice of the ϵ -SVR method confronting its advantages to the characteristics of typical neural network.

Keywords: technical wear, neural networks, support vector machine, fuzzy systems