

III. Photogrammetry and Remote Sensing

Cantemir Adriana, Dogaru Margarita, Parvulescu Nicoleta, Visan Alexandru: *The use of Lidar data in the process of topographic maps updating*

Classic representation of the terrain through contour lines derived from DTM remains the best method of surfacing the earth on a map, nevertheless the correlation with other layers such Hydrography are mandatory. In the context of the current national coverage of the Digital Terrain Model, one of the main concerns of the National Center of Cartography, through the Cartography and Photogrammetry department, is represented by the exploitation of the available data in order to update the layers of the Topographic Reference Map 1: 5000, known under the name of TOPRO5 and, at the same time the 1: 50 000 scale map of Romania. This paper investigates the perspective of using DTM derived products along with other data sources in the process of updating the layers of TOPRO5. Other future perspective for creating a 3D version of the base layers of TOPRO5 are presented.

1. Madalin Ciprian Petrila: *Object oriented classification - a comparative study of ENVI feature extraction methods*

This research aims to analyze two object oriented classification algorithms implemented on ENVI software to show advantages and disadvantages of each method and suggest which method is much feasible in a certain situations and why. Being considered a process that requires fewer resources, extracting features of interest from satellite imagery may prove to be an alternative that can provide good results while having a low production cost and high applicability. Also, object oriented classification procedures can be used for an accurately mapping of heterogeneous land cover areas such as: urban areas, rural or suburban areas, natural land cover, etc. By combining satellite images of very high resolution with ancillary data, taken by different methods: GPS, classical measurements, LiDAR, vectorized maps and plans, the result can have a significant accuracy. Based on Donnay, (Donnay, 1999), the availability of satellite-based land use maps, generally improved with ancillary data, constitutes a starting point for many applications in different domains of spatial planning. This research project has demonstrated the potential of the object based classification, contained by ENVI software, as a tool for classifying urban areas.

2. Ana-Maria Loghin, Valeria Ersilia Oniga: *A comparative study on camera calibration algorithms*

In the recent decade, buildings 3D models are in a high demand by many public and private organizations. The extraction procedure of high accuracy measurements from images is one of the principal tasks of close-range photogrammetry. The particular techniques used in

buildings 3D models creation mostly require an accurate calibration process of metric or non-metric digital cameras. Over the years, there were developed many calibration algorithms by several authors, such as: Tsai, Heikkilä & Silven, Bakstein & Halir, Zhang, etc. This paper aims to present a comparison between the intrinsic calibration parameters determined using the Tsai calibration algorithm, respectively the Heikkilä & Silven algorithm and their influence on building 3D model accuracy. In order to obtain the results, the 3D model of the historical monument "Dosoftei House" from Iași-City was created, based on image – data acquired with the Nikon Coolpix L810 digital camera. The camera calibration process, was performed using a 3D calibration object and the two algorithms mentioned above.

3. Daniel George Butnariu, Valeria Ersilia Oniga, Florian Statescu: A new expeditious method for buildings 3D models creation

In recent years buildings 3D models have known a great evolution, being used in a wide variety of domains such as industry, cultural heritage, architecture, etc. where high precision is needed and also a high level of detail. For many years, close-range photogrammetry has been dealing with the extraction of high accurate informations from images. But, in order to obtain this precision, we need to use a camera whose intrinsic parameters are determined with high accuracy and we also have to respect some conditions when images are acquired. Therefore, there are some domains and applications, where buildings 3D models can be created with low accuracy, such as GIS applications, without any loss of detail. So, this paper presents a new method for buildings 3D models creation in an expeditious mode, based on digital images, acquired with a digital non-metric camera. The advantage of this method is that the camera doesn't require calibration and we can obtain a very realistic 3D model with a high level of detail and meters accuracy.

4. Nicoleta-Viorela Iurist (Dumitrascu), Valeria Ersilia Oniga, Florian Statescu: Comparative study on digital terrain models created based on ALS data and Pleiades images

Digital terrain models are used in wide variety of domains and applications, of which the most important are: orthorectification of aerial and satellite images, space object modelling, hydrological modeling, etc. There are several techniques for data acquisition in order to create digital terrain models, such as photogrammetry, radargrammetry, interferometry, airborne laser scanning, surveying and geodetic and cartographic digitization. This paper aims to present a comparison between the digital terrain models created based on ALS data, respectively Pleiades images. To achieve results, first was created the digital terrain model based on ALS data, using an interpolation grid side of 1m and moving plane interpolation method. Then, the digital terrain model of the same area, was created based on highly dense point cloud, obtained automatically by matching two Pleiades images, using the feature-based and least-squares matching techniques. A comparative study was made on these two digital terrain models, by performing the vertical difference between them, using the Hausdorff distance.

5. Maria Roberta Gridan, Carmen Grecea: *Digital terrain model; overview and draw up*

Since a long time ago people studied the Earths terrain: geologists study its structure, geomorphologists study its forming process, civil engineers construct on it, architects design on it and geodetic engineers, measure and present its surface in different ways such as maps, orthoimages, perspective views, etc. The common interest of all these specialists is that the terrain surface to be represented in an accurate form. This representation can be made through the digital terrain model which offers quickness and high productivity both how the data is collected (technologies such as scanners and stereophotogrammetry) and as well as the existing software solutions. This paper presents the digital terrain model of a stone quarry, from Arad County, regarding information about surface texture and elevation.

6. Dragos Badea, Paul Dumitru, Octavian Badescu, Doina Vasilca: *Oil spill detection using Radar*

As we already know, oil spills/slicks are a major cause of water pollution. The complications deriving from detecting the oil spills are generated by the wind and the water surface conditions. Data processing and optimization should be done carefully, taking into account the fact that reflexions are very low in the oil spots/slicks areas. The paper presents an optimized method in order to detect and classify these oil slicks, by using radar data within the spots polluted areas. A case study is also presented.

7. Marian Jenaru, Alexandra-Elena Ilie, Emanuel-Gabriel Pavel, Loredana Stoica: *Creating virtual objects using Computer Aided Design*

Though history of architecture, drawing was the dominant way to represent objects. Amplitude of this tradition is evidenced later in the way computers were adopted in desing and drawing assisted by computer named CAD-Computer Aided Design. Conventional data used in execution of a CAD are represented by elements measured in real world. New elements taken with different methods and techniques can be associated to those measurements for more accurate creation of virtual objects.