MEDICAL IMAGE MINING FOR EARLY PREDICTION AND IDENTIFICATION OF HEART STROKES BY USING THE MOK ALGORITHM

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ABSTRACT:

Now a days the computer networks Manets plays an important role. By using the manners we can send a data from one server to another clients they are saying that the sender and receiver the manner is the study of how to make a networks do things which at movement the manners do the beter thing in the world of the society of distributed systems are plays a vital role in the filed of the networks in this paper we are showing the distributed systems are powerful in mobile ado networks

1. Introduction

Nowadays, lots of data are stored as images. Satellite images are examples of these types of data. Recognition of patterns, independencies of features and detection of objects are role of image mining [1]. Image mining is a technique to explore the direct knowledge of image. It is needed to identify road networks to update the large-scale maps and GPS tools of intelligent emergency vehicles. For extraction of urban information, satellite images are used by many researchers [2]. Information extraction from satellite images usually was done by manual or semi-automatic methods which are expensive and time consuming. To overcome these limitations, automatic methods of image mining are required. On the other hand, the development of image analyzing technology together with advantages of computer processing led to development of automatic methods to extract image objects. Various methods and algorithms for road detection were used by different researchers [3]. Taking risk of road detection in complex urban areas which includes many objects is the main motivation of this research. There are many cities through the developing countries without systematic urban development; therefore designing of a system for information extraction seems to be necessary. In this paper four feature classes are considered: Water, road, building and vegetation. The paper is organized as follows. The following section gives a background of image mining that our approach is based on it. Section 3 presents proposed method. Finally, some conclusions are given in section 4.

2. Related Works

Many researchers studied road detection on satellite images. Cheng et al. extract road by presenting a road junction extraction method with two stages. First, global detection is performed to find the central positions of the road junction candidates by using morphological operators. Second, the shape of a road junction is identified based on a valley-finding algorithm. The proposed method is validated by airborne synthetic aperture radar (SAR) images of 1 m resolution [4].

Unsalan et al. proposed a novel system, which has three main modules: Probabilistic road center detection
- Road shape extraction
- Graph-theory-based road network
- formation.

These modules may be used sequentially or interchangeably depending on the application at hand. To show the strengths and weaknesses of the proposed system, the authors tested it on several very high resolution satellite image sets [5].

Clode et al, offered a new method for roads in Sydney, Australia, by using lidar data. This method relies on the region growing area and objective classification of the road. The new method has corrected some of the problems that were faced with the previous classification [6]. There is no possibility to compare the obtained result by other works because the inputs of algorithm and methods are different.

3. Image Mining

Image mining discuses about extraction of implicit knowledge from images and implied relations between the objects and their patterns [7]. Image mining systems are designed for special reasons and their goal is information extraction based on operator's demands [8]. This research has two phases including firstly segmentation of images and, then classification of images in hieratical structure and interpretation of the results.

4. Data and Case Study Area

In this paper we used two group of data set; Lidar data and aerial images. Data obtained from center of San

Francisco in 2010 and 2011. In this section we describe the data used in road network detection

4.1. Pan- Sharped Image Multi-spectral and panchromatic images of Quick bird obtained by Asturim service in October 2011 with a resolution of 2 m and o.5 m were used through this investigation. By coregistration of these two images, four bands raster file with a resolution of 0.5 m were obtained. Pan- Sharped image of the under study area is shown in Figure 1

Figure 1: Pan-Sharped of the Case Study Area

4.2. Lidar Data Lidar is a remote sensing system which determines distance of the target by estimation of the reflection time of emitted laser beam on the target. Also the intensity of reflected light can identify object's ingredients. Lidar data includes DEM, DSM, and intensity layers. Lidar raster layers are shown in Figure 2
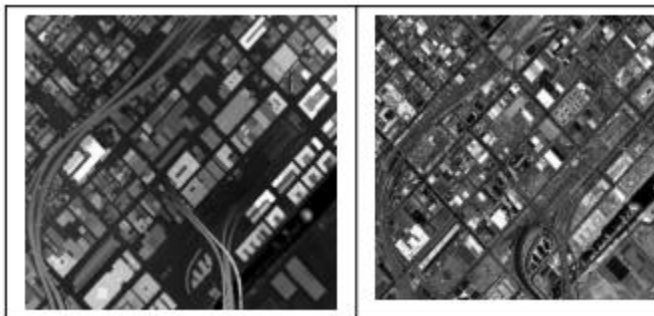

Figure 2: Lidar Data (Left Image Shows Lidar Height Data and Right Image Shows Lidar Intensity Data)

5.   Proposed Method
In this section the different steps of road detection are described as follows:

Step1:
 Data preparation, in this step Normalize Different Water Index1 and Normalize Different Vegetation Index 2 are produced from PanSharped image. These features are then calculated by the following equations:

$$NDVI = \frac{NIR-Red}{NIR+Red} \tag{1}$$

$$NDWI = \frac{Green-NIR}{Green+NIR} \tag{2}$$

For detection of vegetation, NDVI raster layer is analyzed and proper threshold is determined. Threshold of shade and water class is calculated by applying a threshold on NDWI layer.

Step2:
 The second phase consists of image segmentation which isolates main components of the image (pixels) and turns them to the objects based on a certain criteria [6]. Generally there are two ways for image classification; pixelbased and object-based approaches. Pixel based methods analyze only based on the spectral characteristics of the pixels [9]. However, other features such as texture and the geometric characteristics are not considered in this type of analysis. Objects in urban areas are not pure so it causes errors in the final classification results and reduces the classification accuracy [6]. In object-based method pixels are divided into meaningful objects. Segmentation parameters were determined and as a result road detection becomes easier. In one level of segmentation, there are objects with different sizes. So we used objects in different level in hieratical manner. In first level of segmentation, high objects are separated from low objects and road detection is followed in each class separately. In second level of segmentation, objects are classified based on intensity and information of first level. In addition of spectral features other characteristics such as shape, texture and geometry are considered in Object-based approach which makes this method more useful than pixel-based one [10, 11]. Therefore we used object-base analysis to reach high classification accuracy in urban areas.

 Step 3:

 In third phase segmentation process is done. For this part we need some features to classify objects. Therefore several features are selected for demanded classes.
By using of height feature objects divide into high class and low class. Classification of vegetation and water is performed by NDVI and NDWI. By consideration of road network properties, some features are chosen to determine road classes which are consist of Intensity of LIDAR, length to width of the objects and composition of height

and intensity features. Classification is applied in hierarchal manner so features will be inherited from parent class to child class. In this way search domain is limited and the time of process will be reduced. Step4: Forth phase is followed by formation of hierarchal structure. First of all, parent classes (high class and low class) are identified by thresholding of height. SVM and fuzzy rule based method are performed on data to eliminate weakness of each algorithm.

Fuzzy rule based method benefits some fuzzy functions which are composition of some logical operators like And, or and Not. The least membership function

considered equal to 0.2 that means objects with member function lower than 0.2 wouldn't be classified [12]. To solve problem of high dimensional feature space and prevent information loss in feature space reduction, SVM classifier is applied on high class which also increases the speed of process [13]. Step5: In fifth phase high level road class is combined to low level road class. In this way final road class will be introduced by post process. Trees, transmission lines, advertisement billboards, driving boards are removed from road class in post classification step. Flow
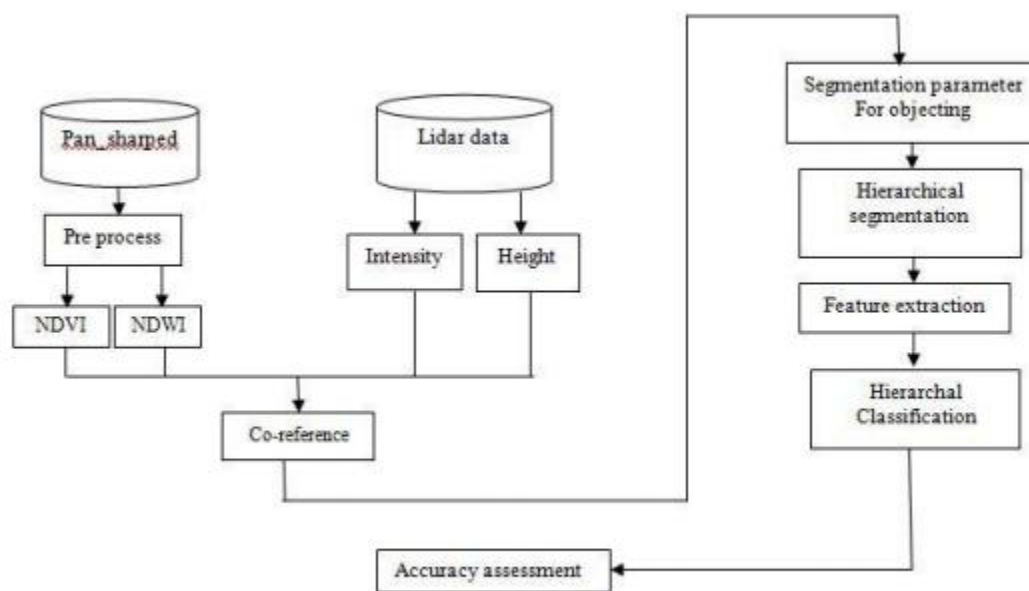

Figure 3: Diagram of Proposed Method

6.   Results & Discussion

Table 1 shows classification results. The error matrix is obtained by e-Cognition software. Columns of error matrix indicate real classes and the rows show forecasted classes by classification algorithms. Figure 5 and Figure 6 presented the user accuracy and producer accuracy for each class, respectively. These figures compare the accuracy of fuzzy rule base, SVM and proposed method. User accuracy indicates reliability to classification algorithm and producer accuracy shows probability of correct classification in its right class. Kappa coefficient computes classification accuracy in comparison with an accidental classification. Overlay, the accuracy of road classification is 95% which shows strength of algorithms.
 Road detection is performed by SVM and fuzzy rule based classifiers separately. Interpretation of results

showed that segmentation and objectbased method increase accuracy of classification. So Integration of both classifiers raises accuracy of results.

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Conclusion

 Taking attention of results indicated the important role of LIDAR data in classification of complicated urban areas

which helps users in crisis. Feature selection is an essential step in

classification and segmentation phase.

 References

 [1] Parul M., Gawande A. D., Gautam K. ,(2013), "Image Mining for Image Retrieval Using Hierarchical K-Means Algorithm", International Journal of Research in Computer Engineering and Electronics, Vol 2, 2,pp:63-68

 [2] Bouziani, M., Goita, K., He D.C., (2010), "RuleBased Classification of a Very High Resolution Image in an Urban Environment Using Multispectral Segmentation Guided by Cartographic Data", IEEE Transactions on Geoscience and Remote Sensing, Vol. 48, No. 8

[3] Gecena R., Sarp G. ,(2008), "road detection from high and low resolution satellite images" The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences. Vol. XXXVII. Part B4.

 [4] Jianghua C., Tian J., Xishu K., (2013), "Road junction extraction in high-resolution SAR images via morphological detection and shape identification", Remote Sensing Letters, 4, pp: 296- 305. [5] Cem U., emote Sensing Joint Event, pp:14-19

Beril S., (2012), "Road Network Detection Using Probabilistic and Graph Theoretical Methods", IEEE Transactions on Geoscience and Remote Sensing, 50, pp: 4441- 12.

 [6] Hay G.J. and Castilla G., (2009), "object-based image analysis :strengths, weakness, opportunities and threats(SWOT)", The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Science, pp:212-220

[7] Hsu W.,Lee M., Zhang J., (2002), "Image Mining: Trends and Developments", Journal of Intelligent Information System in the netherland

 [8] Sudhir R., (2011), "A Survey on Image Mining Techniques: Theory and Applications", Computer Engineering and Intelligent Systems, Vol 2, No.6,pp:20-27

[9] E, Eid H., (2011), "Automated urban features classification and recognition from combind RGB/Lidar data in Geomatics engineering", Calgary,pp:1-14

 [10] Wei L., Li P., Zhang L., Zhong Y., (2009), "An Advanced Change Detection Method Based on Object-Oriented Classification of Multi-band Remote Sensing Image", IEEE, Urban R