

AUTOMATIC FEATURE EXTRACTION FROM SATELLITE IMAGES USING ARTIFICIAL NEURAL NETWORK

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Feature extraction is important for a variety of applications, particularly due to the increasing interest in automatically updating GIS databases from imagery to efficiently manage spatial data. Advantages of extraction of feature using remote sensing include the ability to obtain information regarding land cover or land use of any area, the speed with which remotely sensed data can be collected and processed, the relative low cost of data, and the ability to collect data easily.

This project proposes an integrated approach for automatic object boundary extraction from Quick Bird remotely sensed imagery and integrates a GIS database with the extracted information by combining digital image processing, remote sensing and geographic information system technologies. Learning Vector Quantization Artificial Neural Network approach was employed in this study. The digital number values of each image pixels were converted into reflectance and segmented depending on that value. Learning Vector Quantization was used to segment four main feature categories: water, vegetation, roads and building from image to detect and recognize them. The accuracy is ensured by quality matrices. Furthermore, GIS database was updated with the extracted information.

This method was tested on different subset images taken from Colombo region (urban area) with 78% accuracy, which shows the good stability of the Learning Vector Quantization for the segmentation. Finally, the integration of Geographical Information System and remote sensing technologies provides a promising approach for GIS data collecting and updating.