



DELHI TECHNOLOGICAL UNIVERSITY

DELHI- 110042

CERTIFICATE

This is to certify that the work contained in this dissertation entitled "**Nature Inspired Meta-Heuristic Approach to capture terrain features**" submitted in the partial fulfilment, for the award for the degree of M.Tech in Computer Technology and Applications at **DELHI TECHNOLOGICAL UNIVERSITY** by **Akanksha Bharadwaj, Roll No. 01/CTA/10**, is carried out by her under my supervision. This matter embodied in this project work has not been submitted earlier for the award of any degree or diploma in any university/institution to the best of our knowledge and belief.

Date: _____

(Dr. DAYA GUPTA)

HOD & PROJECT GUIDE

(Dept. of Computer Engineering)

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Akanksha Bharadwaj

College Roll no: 01/CTA/10

M.Tech. (Computer Technology and Application)

Department of Computer Engineering

Delhi Technological University

Delhi-110042

ABSTRACT

In recent years image classification has emerged as one the most significant area of research in the field of remote sensing. It helps us to acquire the geo-spatial information from the satellite data which can be useful to industries like defense, intelligence, natural resources etc. A great deal of vagueness, uncertainty and ambiguity exist when categorizing geographic objects on the basis of geospatial information received from the satellite. At present various techniques like Minimum distance to Mean, Rough set theory, Biogeography Based Optimization (BBO), Ant Colony Optimization (ACO) etc are available for image classification. All these techniques classified the terrain features but suffered from some uncertainties. In this study we have proposed framework for Cuckoo Search (CS) based satellite image classification. CS has limited number of application as its still an emerging algorithm, so we have used it in Remote Sensing. We are making this algorithm for several generic characteristics of the features in earth observation satellite (EOS) images. The main advantage of CS over other metaheuristic approach is that its search space is extensive in nature.

Though most of existing algorithms have shown satisfying results for image classification, the main problems faced by most of them is recognition of mixed pixels in an image and efficient tagging of these mixed pixels. In order to overcome the disadvantages of the previous techniques we have extended our approach for the resolution of mixed pixel in a multi-spectral, multi-resolution and multi-sensor satellite image.

The image classification technique is validated by applying it to the image of size 472 X 546 dimension of Alwar area in Rajasthan, India obtained from Indian Remote Sensing Satellite Resourcesat, and image of size 641 X 641 dimension of Saharanpur area in Uttar Pradesh, India. The satellite image of Alwar region is taken for 7 different bands and the satellite

image of Saharanpur is taken for 6 different bands. Algorithm for resolution of mixed pixel is validated on the Alwar dataset.

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