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BSCS-5A

Digital image processing

Assignment 1

# PROBLEM STATEMENT:

Use of freely accessible datasets and machine learning techniques in prediction and monitoring of deforestation

# ABASTRACT:

There is a wide range of quality datasets freely available for geo-informatics like forests. We evaluate the usefulness of free datasets for deforestation prediction by comparing generalized linear models and generalized linear mixed models with a variety of machine learning models. Freely available datasets were able to generate plausible risk maps of deforestation using all techniques.

# Why computer science for deforestation management?

Main reason for using computer science for deforestation management is that we can analyze large areas using computer vision in less time spam. The global map technology team hopes that their maps will help in predicting changes in future land use and the effects of climate-related deforestation. Governments and environment-oriented organizations can use the readily available vast data to hopefully make better policies to protect the forests.

# Solution:

We will use Community Forest Management (CFM)’s image datasets and Google satellite image datasets for Training our machines. We evaluate the usefulness of free datasets for deforestation prediction by comparing generalized linear models and generalized linear mixed models (GLMMs) with a variety of machine learning models (Bayesian networks, artificial neural networks and Gaussian processes) across two study regions. We will also analyze the population increase and weed consumption in the market. If the population is increasing with a huge rate and there are colonies near forests, it has very much chances for deforestation. greenhouse gas contributions and the impact of profoundly negative biodiversity. Deforestation increases atmospheric CO2 and other trace gases, possibly affecting climate, because the concentration of carbon is higher in forests than in the agricultural lands which replace them.

Remote sensing provides a viable source of data from which updated land-cover information can be extracted efficiently and cheaply in order to inventory and monitor these changes effectively. Thus change detection has become a major application of remotely sensed data because of repetitive coverage at short intervals and consistent image quality.

# Data and methodology:

The Landsat MSS images used in the present study belong to the NALC triplicate dataset and have been geometrically and radiometrically corrected by the EROS Digital Image Processing Centre. The images were corrected and resampled, using cubic convolution, to a UTM projected output image composed of 60 x 60 m pixels, with an root mean square error (rmse) of less than 1.0 pixel.

Managing multi-date picture datasets requires that pictures acquired by sensors at various circumstances are practically identical regarding radiometric qualities. This as a rule does not occur notwithstanding for pictures produced by a similar sensor for a few reasons, for example, change in radiometric execution after some time, variety in sun powered brightening conditions, air dissipating and retention and changes in climatic conditions (nearness of mists). In this manner, if any two datasets are to be utilized for quantitative examination in light of radiometric data, as on account of multi-date investigation for identifying surface changes, they should be acclimated to adjust for radiometric disparity. There are two approaches to accomplish these radiometric remuneration: (1) performing radiometric alignment, changing over the whole dataset from computerized number esteems into ground reflectance esteems and, (2) playing out a relative radiometric standardization between the multi-date pictures. The main way is by and large more mind boggling than the second and is typically superfluous for the straightforward reason for change location. Ordinary strategies for applying relative radiometric standardization utilize factual parameters of the entire scene or chose subsets accepted to be frightfully steady. In any case, these strategies don't repay every barometrical impact, especially when mists are available in one of the pictures, or require some level of human mediation in choosing control pixels.

Image difference of two different dated datasets will be calculated and then analyzed. In the result we will get residual image which will tell us about the area has changed with time. Vegetation index difference will also be calculated for this. Combination image enhancement/post-classification analysis will also be used for better results.

# SWOT Analysis:

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| Strengths:   1. Freely available datasets 2. Area administration 3. Surveillance devices 4. Past research by scholars 5. Funding 6. Performance bench marks 7. Principles | Weakness:   1. Missed places by radars 2. Limited computation power 3. Policy enforcement 4. expenditures |
| Opportunities:   1. working organizations 2. policy enforcement is easy for administration | Threats:   1. Funding 2. Political interference |