GUI for Automated change detection in rate of deforestation using fusion of optical and series of SAR images

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ABSTRACT

We propose our work of creating a GUI application to automatically detect change in deforestation rate of given areas with the help of fusion of optical and SAR images.

In the past , many fusion techniques have been given devised to detect changes in forest cover but we lack a mechanism that can be accessible to common person and give an insight of rate of deforestation taking place in the region of which the user gives the data as input.
This GUI is a web application which will take images as input from the user and will do all the calculation and give the rate of deforestation in the form of a graph for a span of time(eg. 5-6 years or more)

We have made an attempt to make the fusion technique relatively simpler for our GUI.
First of all, preprocessing of SAR images and optical image are done i.e. Terrain correction and speckle noise filtering for SAR data. With the help of NDVI parameter of Optical and NDR parameter of SAR we detect the vegetation and forest areas in both the data set and assign 1 to the concerned region and 0 to the others.
Then , we took the OR of both the matrix to finally get the matrix that gives the area that is covered with vegetation and forest areas. In this technique we finally get to play with discrete data. i.e. we converted the gray scale value of image to finally represent either 1 and 0 , which becomes very convenient to detect the changes further.

Then one by one further set of image is taken and compared. We simply subtract this pixel by pixel formatted matrix. There is 3 possibilities- we can have 0,1 or -1 which indicates -
0 – No change in forest areas.
1 – Deforestation took place
-1 – Forestation took place

Then we can count the no. of 0,1 and -1 in the matrix of the compared image and convert them into percentage to get the percentage change in forest area. Hence we can plot a map of the deforestation rate of the concerned area.

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