SAR IMAGE SEGMENTATION USING REGION GROWING AND SPECTRAL CLUSTER

This project involves method based on Region Growing (RG) and Spectral Cluster (SC) for segmentation of synthetic aperture radar (SAR) images. In the method first RG is applied to the SAR images in order to find the edges and then segmentation is done on the output of RG using SC method. A flowchart for the same is shown below :-
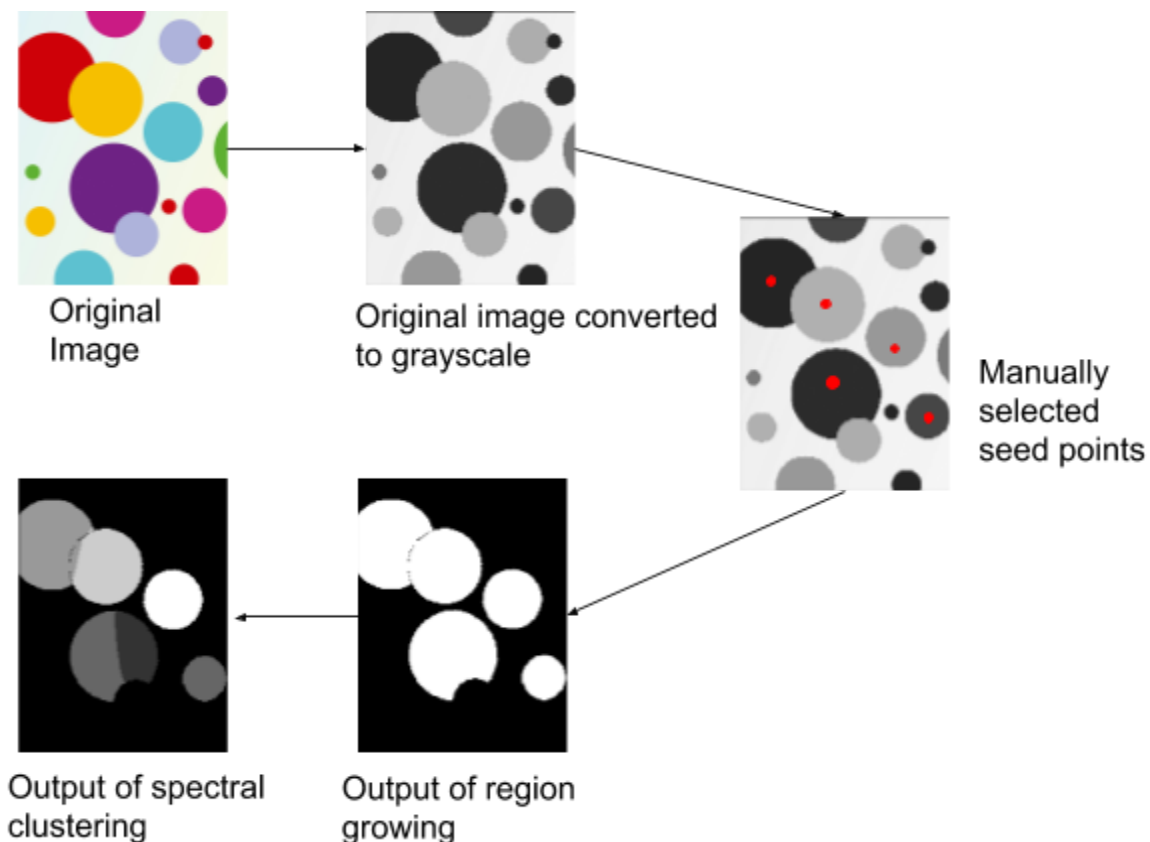

Figure 1: Workflow of the proposed method

Figure 2: Flowchart of the proposed method

Region Growing :-

First, a pixel is manually selected and called a seed point. This point is compared with neighboring pixel. Similar neighboring pixels are added to seed point of each region therefore the region is grown.When the growth for one region is stopped another seed point which is not a member of the former region should be selected.

Spectral Clustering :-

SAR images can be considered as a weighted graph G(V, E, W), where V is vertices (data points) and E is edge if the similarity is positive and W is defined to be edge weights. Given data points {x1, x2, ..., xn } that can be considered as graph nodes. They are partitioned into groups so that nodes in a group are most similar and nodes in the different group have less similarity.

Libraries used :-
1. Tkinter
2. Numpy
3. OpenCV
4. Scikit-learn
5. Matplotlib
6. PIL - Python Imaging Library