Assignment 2 IML

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Abstract

In KNN algorithm we have to compute an unknown value at a certain point by checking K nearest neighbors. We take value of K as an odd integer so that there will no conflict in decision of the unknown point.

Introduction

In this Assignment we applied KNN algorithm on an image of Italy map consist of land and water, although we have some empty pixels of the map images which we have to compute through KNN algorithm where the value of K will be differ from 1, 3, 5, 7 and 9.

Dataset Description

In given dataset we are given 5 images with 10, 20, 30, 40 and 50 percent of the original image. It means in 10 percent image only 10% of pixel value are known to us and we must compute 90% of image by applying KNN algorithm on it, and same computation for remaining images.

Methodology & Implementation Details

In this Assignment the methodology we used is that for each unknown point in 10% or 20% or in other images we check K nearest neighbors either they are green or blue, whose count will be greater that unknown point will be assigned that color. First, we check 10% image with K=1 then K=3 up to K=9 and then repeat this same process for 20% image and respectively.

In checking the nearest neighbors, we take distances from that unknown point to 20 pixels surrounding of the image and store K nearest color pixel.

Results

In result we get 50 images filled completely with water(blue) or land(green) pixels. After getting these 50 images we are now calculating **accuracy**, **sensitivity** and **specificity** **W.RT. LAND** of the images with respect to the original image **Italy.png** and save in text files in text directory of Assignment2 folder.

Discussion

Our results are nearly same but not exact same this can be seen by checking the accuracy of each image. The accuracy is increasing by increasing the % of pixel given and by the value of K increasing.

Conclusion

KNN algorithm will increase accuracy by increasing value of K.