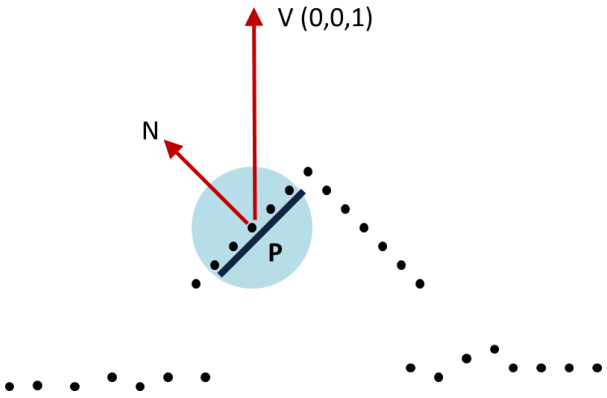
APG4011F Assignment 2: Point cloud classification

Assigned on: 8 May 2017



Point Cloud Classification

You are to write a program to classify a point cloud. The program should:

1. Read a point cloud file (*.xyz)
2. Get the K points in the neighbourhood of a point P. The choice of the size of the neighbourhood is up to you. You can use the fast nearest neighbour function in scikit learn for this.
3. Use the point neighbourhood to determine geometric features for every point in the cloud. Examples of features are point normal, x-range, y-range, eigenvalues, etc.,
4. Perform an unsupervised classification (clustering) on the features. For this you can use the scikit-learn python library.
5. Use the unsupervised classification to label the points.
6. Write the point coordinates and their labels to a point file, 'pointfile.xyz'.
7. Visualise the point cloud in Cloud Compare and color the points according to the angle between the point normal and the vertical.
8. Try to improve your classification by using different features.

Answer the following:

1. Suggest how the program could be extended to perform a point cloud segmentation/classification.

You are to submit a report containing:

1. A report of your work and your results
2. Your python code

Submission: Zip all your files and place them in your vula drop box. The zip file should be name Assign2_YourName.zip