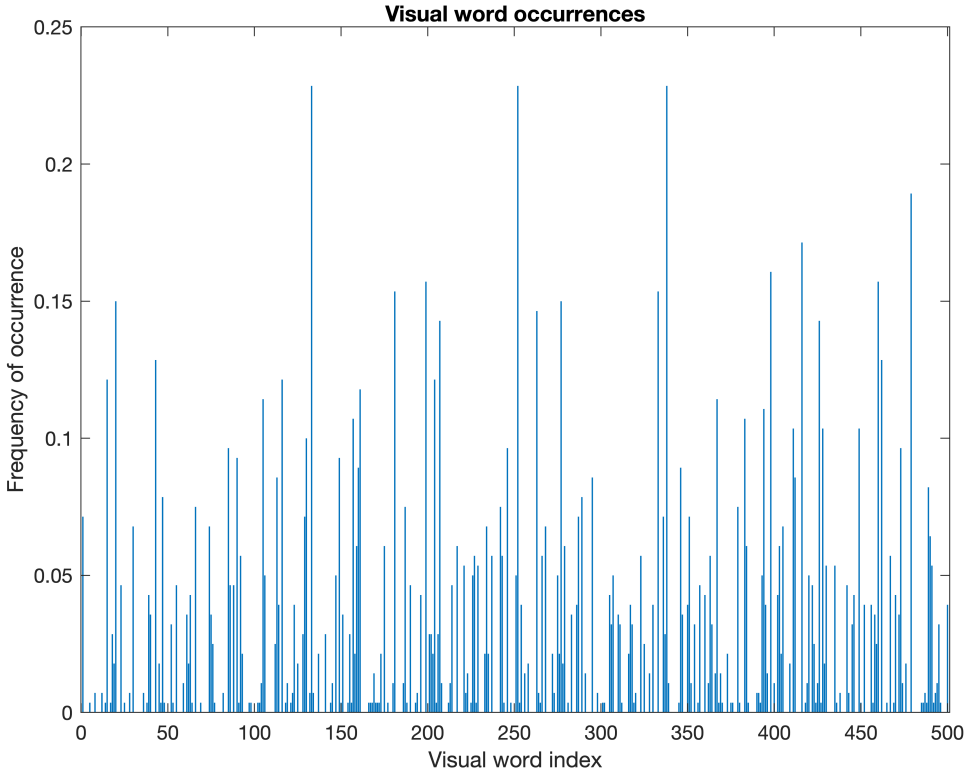
```
imds = imageDatastore('/Users/bhargavmuppalla/Desktop/Vehicles', 'IncludeSubfolders',

tbl = countEachLabel(imds);

[trainingSet, validationSet] = splitEachLabel(imds, 0.6, 'randomize');

bag = bagOfFeatures(trainingSet);
```

```
Creating Bag-Of-Features.
-------------------------
* Image category 1: bikes
* Image category 2: buses
* Image category 3: cars
* Image category 4: trains
* Selecting feature point locations using the Grid method.
* Extracting SURF features from the selected feature point locations.
** The GridStep is [8 8] and the BlockWidth is [32 64 96 128].

* Extracting features from 9 images...done. Extracted 1565160 features.

* Keeping 80 percent of the strongest features from each category.

* Balancing the number of features across all image categories to improve clustering.
** Image category 1 has the least number of strongest features: 5005.
** Using the strongest 5005 features from each of the other image categories.

* Creating a 500 word visual vocabulary.
* Number of levels: 1
* Branching factor: 500
* Number of clustering steps: 1

* [Step 1/1] Clustering vocabulary level 1.
* Number of features          : 20020
* Number of clusters          : 500
* Initializing cluster centers...100.00%.
* Clustering...completed 38/100 iterations (~0.04 seconds/iteration)...converged in 38 iterations.

* Finished creating Bag-Of-Features
```

```
img = readimage(imds, 1);
featureVector = encode(bag, img);
```

```
Encoding images using Bag-Of-Features.
--------------------------------------
* Encoding an image...done.
```

```
% Plot the histogram of visual word occurrences
figure
bar(featureVector)
title('Visual word occurrences')
xlabel('Visual word index')
ylabel('Frequency of occurrence')
```


Visual word occurrences
Frequency of occurrence
Visual word index
0.25
0.2
0.15
0.1
0.05
0
0
50
100
150
200
250
300
350
400
450
500