# Transfer Learning using AlexNet and Dog Breed Classifier Dataset

You will need to have modified dataset.

- Download the "Dog Breed Identification" dataset from (https://www.kaggle.com/c/dog-breed-identification/data)
- Run "ModifyDataset.mlx" script to modify the dataset into directory wise categories

## Train

### Set up testing data

```
rootFolder = 'test';

LabelData = readtable('.\labels.csv', 'Format', '%C%C');
BreedLabels = string(transpose(table2cell(unique(LabelData(:,'breed')))));

BreedCount = numel(BreedLabels)
```

```
BreedCount = 120
```

```
testDS = imageDatastore(fullfile(rootFolder, BreedLabels), 'LabelSource', 'foldernames');
testDS.ReadFcn = @readFunctionTrain;
```

### Import GoogLeNet trained with Transfer Learning

Importing trained network for some manual validation and results.

```
GoogLeNet_convnet = trainedNetwork_1;
```

### Test classifer

```
[labels,err_test] = classify(GoogLeNet_convnet, testDS, 'MiniBatchSize', 64);
```

### Determine overall accuracy

```
GoogLeNet_confMat = confusionmat(testDS.Labels, labels);
GoogLeNet_confMat = GoogLeNet_confMat./sum(GoogLeNet_confMat,2);
OverallAccuracy = mean(diag(GoogLeNet_confMat))
```

```
OverallAccuracy = 0.9394
```

```
BreedAcc = diag(GoogLeNet_confMat).';
int_confMat = int64(GoogLeNet_confMat .* 10000)
```

```
int_confMat = 120×120 int64 matrix
    9625       0       0       0       0       0       0       0       0       0 ···
       0    9569       0       0       0       0       0       0       0       0
       0       0   10000       0       0       0       0       0       0       0
       0       0       0    9439       0       0      93       0       0       0
       0       0       0       0    8784       0       0       0       0       0
       0       0       0       0       0    8974       0       0       0       0
       0       0       0       0       0       0    9216       0       0       0
       0       0       0       0       0       0       0    9636       0       0
       0       0       0       0       0       0       0       0    9390       0
       0       0       0       0       0       0       0       0     190    9429
      ⋮
```

```
confusionchart(int_confMat)
```