Department of Computer Science
Faculty of Science, Kasetsart University

Lab 7 Shape Classification

Asst.Prof. Dr. Pakaket Wattuya

STEP 1: Shape Extraction (using Thresholding method)

Original Image → Binary Image → Postprocessing

STEP 2: Feature Extraction

MATLAB functions	Example
`STATS = regionprops(BW, properties)`	`Measure properties of image regions.` `Property Name: 'Area','Circularity','Eccentricity',etc.`

Feature Vector (X):

idx	f_1	f_2	…	f_n
1			…	
2			…	
…			…	
25			…	

ClassNames : (trainLabel.mat)

idx	Class
1	Phyllestachys pubescens
2	Phyllestachys pubescens
…	
6	Acer Dalmatum
…	
25	Ilex macrocarpa

Feature Vector (XTest):

idx	f_1	f_2	…	f_n
1			…	
2			…	
…			…	
15			…	

ClassNames : (testLabel.mat)

idx	Class
1	Phyllestachys pubescens
2	Phyllestachys pubescens
…	
6	Acer Dalmatum
…	
15	Ilex macrocarpa

STEP 3: Classification

3.1 Train a multiclass ECOC model using the default options.

```
load('trainLabel.mat');
Mdl = fitcecoc(X,trainLabel)
```

3.2 Prediction

```
load('testLabel.mat');
predictedLabels = predict(Mdl,XTest);
table(testLabel(:),predictedLabels (:),'VariableNames',{'TrueLabels','PredictedLabels'})
```

```
ans = 15×2 table
            TrueLabels                  PredictedLabels
     _______________________        _______________________

     Phyllestachys pubescens        Phyllestachys pubescens
     Phyllestachys pubescens        Phyllestachys pubescens
     Phyllestachys pubescens        Phyllestachys pubescens
     Acer Dalmatum                  Acer Dalmatum
     ...                            ...
```

Training Set :

Phyllestachys pubescens

Acer Dalmatum

Phoebe zhennan

Ginkgo biloba

Ilex macrocarpa