1 Program requirements

This program aims to perform classification on shell data using KNN and Random Forest Algorithm. The program is developed based on MATLAB 2018a platform and takes Microsoft Excel as data storage media. Before you run the program, please check the software requirements:

- MATLAB 2018a+
- Microsoft Excel
- Random-Forest-Matlab-master
  (download:https://github.com/karpathy/Random-Forest-Matlab)

2 The environment

2.1 The file system structure

The file structure is shown as follows:

```
.
|----Shell_env
     |---------data
          |-------------color_feature.xlsx
          |-------------shape_feature.xlsx
          |-------------texture_feature.xlsx
     |---------mats
     |---------tools
          |-------------LoadOnColor.m
          |-------------LoadOnShape.m
          |-------------loadOnTexture.m
          |-------------makeshell.m
          |-------------Shell_Forest.m
          |-------------Shell_KNN.m
          |------------- Random-Forest-Matlab-master
|----Run_load_KNN.m
|----Run_load_RF.m
```

2.2 The description of folds and files

The functions of different folds and files in this environment is summarized in the following Table 1 and Table 2.

Foldname	**Discription**
data	To Store excel files of different features
mat	To Store .mat files of different features
tools	To Store auxiliary scripts
Random-Forest-Matlab-master	A third-party matlab toolbox of Random Forest

Table 1 Functions of different folds

Filename	**Discription**
color_feature.xlsx	Excel file contains shell color feature data
shape_feature.xlsx	Excel file contains shell shape feature data
texture_feature.xlsx	Excel file contains shell texture feature data
LoadOnColor.m	Scripts to perform preprocessing on color data
LoadOnShape.m	Scripts to perform preprocessing on shape data

LoadOnTexture.m	Scripts to perform preprocessing on texture data
Makeshell.m	Scripts to integrate three features from .mat file
Shell_Forest.m	Run Random Forest algorithm
Shell_KNN.m	Run KNN algorithm
Run_load_KNN.m	Run KNN algorithm directly
Run_load_RF.m	Run Random Forest algorithm directly

3 Run

To run the program please follow these steps:

1. Enter in directory shell_env.
2. Run file ‘Run_load_KNN.m’ Or ‘Run_load_KNN.m’.