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 )

1. **The environment**
   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

* 1. 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 |

1. **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’.