1. Executable Files

There are 3 files under the folder \sdm_term_project\experiments\software

1) **h0905_0000tile3_24train - cs697.mxd** ArcGIS project file for tile 3_24
2) **h0905_0000tile3_25withlabels - cs697.mxd** ArcGIS project file for tile 3_25
3) **hrsc03classifyweka.py** Python script to call Weka classifier J48

Python script **hrsc03classifyweka.py** uses Weka classifier AdaBoostM1 and J48 for classification. A sample run of hrsc03classifyweka.py is provided as follows. Notice that you should modify the JAVA CLASS PATH for the weka.jar file in the python script according to the location of weka.jar at your machine.

```
C:\ding\sdm_term_project\experiments\software>hrsc03classifyweka.py

C:\ding\sdm_term_project\experiments\software>java -Xmx128m -classpath ".;C:\Pr
ogram Files\QuickTime\QTSystem\QTJava.zip;C:\Program Files\Weka\weka.jar" weka.c
lassifiers.meta.AdaBoostM1 -t ..\craters\trainingsets\hrsccandidatesmasterv0.arf
f -i -k -d ..\craters\h0905_0000\tile3_24\weka\classifyv0.model -P 100 -S 1 -I 1
0 -W weka.classifiers.trees.J48 -- -C 0.25 -M 2  1>..\craters\h0905_0000\tile3_2
4\weka\trainv0.log

C:\ding\sdm_term_project\experiments\software>java -Xmx128m -classpath ".;C:\Pr
ogram Files\QuickTime\QTSystem\QTJava.zip;C:\Program Files\Weka\weka.jar" weka.c
lassifiers.meta.AdaBoostM1 -l ..\craters\h0905_0000\tile3_24\weka\classifyv0.mod
el -T ..\craters\h0905_0000\tile3_24\weka\tile3_24candidatestest.arff -p 1-15  1
>..\craters\h0905_0000\tile3_24\weka\classifiedv0.txt

C:\ding\sdm_term_project\experiments\software>java -Xmx128m -classpath ".;C:\Pr
ogram Files\QuickTime\QTSystem\QTJava.zip;C:\Program Files\Weka\weka.jar" weka.c
lassifiers.meta.AdaBoostM1 -t ..\craters\trainingsets\hrsccandidatesmasterv0.arf
```

```
f -i -k -d ..\craters\h0905_0000\tile3_25\weka\classifyv0.model -P 100 -S 1 -I 1
0 -W weka.classifiers.trees.J48 -- -C 0.25 -M 2  1>..\craters\h0905_0000\tile3_2
5\weka\trainv0.log


C:\ding\sdm_term_project\experiments\software>java -Xmx128m -classpath ".;C:\Pr
ogram Files\QuickTime\QTSystem\QTJava.zip;C:\Program Files\Weka\weka.jar" weka.c
lassifiers.meta.AdaBoostM1 -l ..\craters\h0905_0000\tile3_25\weka\classifyv0.mod
el -T ..\craters\h0905_0000\tile3_25\weka\tile3_25candidatestest.arff -p 1-15  1
>..\craters\h0905_0000\tile3_25\weka\classifiedv0.txt


C:\ding\sdm_term_project\experiments\software>
```

ArcGIS project file **h0905_0000tile3_24train - cs697.mxd** includes information for tile 3_24. You will need to fix the data source for each feature after you copy the file at your computer.

1) Ground truth (manually labeled craters by a domain scientist) is in "Tile3_24labels." The shape data set is located at \sdm_term_project\experiments\craters\h0905_0000\tile3_24\manualshapes\Tile3_24labels.shp
2) Raster data for tile 3_24 is in "Raster." The data is located at \sdm_term_project\experiments\craters\h0905_0000\tile3_24\input\ArcMap\
3) Candidate shapes (before classification) are in "Candidates." There are 23 layers for all candidates originally identified in tile 3_24. Multiple shapes may be generated for one real crater. A new layer is created in order to represent those overlapped shapes correctly. The data is located at \sdm_term_project\experiments\craters\h0905_0000\tile3_24\output\ArcMap\
4) Real craters in ground truth whose diameters are less than 200m are in "trainless200m." The data is located at \sdm_term_project\experiments\craters\h0905_0000\tile3_24\manualshapes\trainless200m.shp

You will need to add another feature for classified shapes after you run the python script hrsc03classifyweka.py. Notice that the python script generates the classified shapes in 23 layers in ASCII data format. For example, see \sdm_term_project\experiments\craters\h0905_0000\tile3_24\weka\

tile3_24classifiedl1_v0.txt, …, tile3_24classifiedl23_v0.txt. You will need to write your own ArcGIS VBA to convert the data from ASCII to Raster to Shapes for all 23 layers.

ArcGIS project file **h0905_0000tile3_25withlabels - cs697.mxd** includes information for tile 3_25. Other than that tile 3_25 has 24 layers for candidate and classified shapes, the file has similar structure as the project file for tile 3_24.

2. Training Sets

Training sets should be placed at the folder \sdm_term_project\experiments\craters\trainingsets. You may put multiple training sets at this folder. You need to modify the file information in the python script hrsc03classifyweka.py to indicate which training set to be used for a run.

3. Candidate Shapes

Candidate shapes initially identified for tiles 3_24 and 3_25 are located at the following two folders, respectively. All the candidate shapes have been loaded into the two ArcGIS projects discussed in Section 1.

\sdm_term_project\experiments\craters\h0905_0000\tile3_24\output\ArcMap

\sdm_term_project\experiments\craters\h0905_0000\tile3_25\output\ArcMap

4. Classification

Folders \sdm_term_project\experiments\craters\h0905_0000\tile3_24\weka and \sdm_term_project\experiments\craters\h0905_0000\tile3_25\weka will be your point of focus. You will need to run the python script hrsc03classifyweka.py many times with different setting of training sets, different classifiers, or different parameter values in order to improve the accuracy rate for prediction.