Term Project: Automatic Detection of Sub-Kilometer Craters in High Resolution Planetary

Assigned Date: Thursday, March 26, 2009

Progress Report Date: 7:00 PM Wednesday, April 15, 2009

Final Report Due Date: Extended to 7:00 PM Wednesday May 20, 2009

~~7:00 PM Monday May 18, 2009~~

Presentation Date: Wednesday May 20, 2009

Educational Goal

Apply spatial data mining techniques to real-world applications.

Phase III: Final Report

Due: Extended to 7:00 PM Wednesday May 20, 2009

~~7:00 PM Monday May 18, 2009~~

Submission Requirements

1. One submission per team. Save the file as sdm_ teamNumber_finalReport. For example, Team 1 should name their file as *sdm_team1_finalReport.docx*.
2. Submit the softcopy through your UMassOnline account at http://boston.umassonline.net/index.cfm.
3. Submit the paper copy along with the cover page in class. Paper copy should be bound firmly together as one pack (for example, staple, but not limited to, at the left corner). 5 points will be deducted for unbounded homework.
4. No hard copies or soft copies results in 0 points.

TERM PROJECT – Final Report

Follow the guidelines as stipulated. Your description should be clear, thorough and comprehensive. The term project final report should satisfy the following goals:

1. The final report will be used to develop a research paper to be submitted in June 2009.
2. The final report can be used in a job interview to show that you have systematically applied spatial data mining techniques to solve a real-world problem with a meaningful and accurate solution.

Format for the Term Project Report

List the entire term members name in the cover page. For the report, you must use the Times New Roman, regular Font 12, single spacing for all the main text (except the titles, Tables, captions of figures and tables).

Report Contents

1. **Executive summary**. One to two pages. Summarize the project objectives, procedures, the results obtained and your conclusion. As a minimum, include the followings:
    a. Project objective
    b. How the experiments were designed
    c. Successful experiments and failed experiments (if any)
    d. Summary of the results, including the final best result on crater detection
    e. Your conclusions
2. **Experiment design and implementation**. Describe the objectives for each set of experiments. List experimental results in table data to show exact data values and plot the results in figures for better illustration. Pseudo code should be used if a complex algorithm is used. In particular, describe methods used and present experimental results for the followings (if applied):
    a. Training set creation
    b. Feature selection (t-test, ROC curves, and any other methods used)
    c. New feature creation
    d. Classifiers selection
    e. Other methods used
    f. Best experimental results on crater detection
3. **Crater illustrations.** Using the best results of your experiments, produce similar figures as Figure 4 and Figure 5 of the paper "Automatic Detection of Sub-Kilometer Craters in High Resolution Planetary Images" by Urbach and Stepinksi. (The paper is posted at UMass Online.)
4. **Personal report.** Each team member contributes one paragraph to discuss lessons learned and experiences gained in this project. Do you like to work with your peer classmates in EEOS/CS? How do you evaluate the performance of the co-learning model (EEOS and CS work together) in this class?

Phase IV: Oral Presentation

Due: 7:00 PM Wednesday May 20, 2009

Submission Requirements

1. Prepare Microsoft PowerPoint slides for your presentation.
2. One submission per team. Save the file as sdm_ teamNumber. For example, Team 1 should name their file as *sdm_team1.pptx*. Submit the softcopy through your UMassOnline account at http://boston.umassonline.net/index.cfm.
3. Prepare a paper copy of the PowerPoint slides with 2 slides per page. Submit the paper copy to the instructor on the presentation day.
4. **Presentation duration**. Each team has 40 minutes on presentation. Each team member should have equal time share on presentation.
5. **Presentation content**. Because audiences understand the project background very well, the presentation should focus on your own design and implementation of experiments. Discuss challenges and open problems in the project.
6. **Individual oral communication rubric**. See next page.

Individual Oral Communication Rubric

Criteria	*1*	*2*	*3*	*4*	*Score*
Meaningful Visuals	Student uses superfluous graphics or no graphics	Student occasionally uses graphics that rarely support text and presentation.	Student's graphics relate to text and presentation.	Student's graphics explain and reinforce screen text and presentation.	
Mechanics	Student's presentation has four or more spelling errors and/or grammatical errors.	Presentation has three misspellings and/or grammatically errors.	Presentation has no more than two misspellings and/or grammatical errors.	Presentation has no misspellings or grammatical errors.	
Eye Contact	Student reads all of report with no eye contact.	Student occasionally uses eye contact, but still reads most of report.	Student maintains eye contact most of the time but frequently returns to notes.	Student maintains eye contact with audience, seldom returning to notes.	
Elocution	Student mumbles, incorrectly pronounces terms, and speaks too quietly for students in the back of class to hear.	Student's voice is low. Student incorrectly pronounces terms. Audience members have difficulty hearing presentation.	Student's voice is clear. Student pronounces most words correctly. Most audience members can hear presentation.	Student uses a clear voice and correct, precise pronunciation of terms so that all audience members can hear presentation.	
Bad Habits	Student exhibits many presentation bad habits such as packing, stammering, hands in pockets, not engaging audience.	Student exhibits four or fewer presentation bad habits such as packing, stammering, hands in pockets, not engaging audience.	Student exhibits three or fewer presentation bad habits such as pacing, stammering, hands in pockets, not engaging audience.	Student exhibits two or fewer presentation bad habits such as packing, stammering, hands in pockets, not engaging audience .	
				Total	