CS 682 Speech Processing  
Fall 2014 / Schedule # 21072

Course and Office Hours
Class meets: Tuesday and Thursday 4:00 – 5:15 PM E-423B
Professor Marie Roch, office GMCS 533 Tue 5:30-6:20 Thu 3:00-3:50, tel: 619 594 5830 e-mail: marie•roch a_t sdsu•edu

Course Overview
You will master machine learning and signal processing skills. We will apply this to recognizing speech and speaker identity, but many of the skills that you will acquire are useful in many contexts such as finance, bioinformatics, control systems, etc. Upon successful completion of this class, students should be able to:

- Understand and implement feature extraction for human speech
- Have an understanding of human speech production and perception.
- Understand the importance of language constituencies and how they can be modeled.
- Learn and be able to implement time-independent and time-dependent machine learning algorithms.
- Be able to write a scientific paper.
- Be well-equipped to understand readings in the speech technologies literature.

Enrollment Information
Prerequisites: Data structures, minimal exposure to linear algebra

Course Materials

Course Structure and Conduct
CS 682 is a lecture-based course. Assignments will primarily use Matlab. Some of the assignments will require Matlab toolboxes (primarily the Signal Processing Toolbox). Full versions of Matlab are available in the dual boot computer science lab (GMCS 425) or may be downloaded to a personal computer (see http://www.rohan.sdsu.edu/~download/matlab.html for details).

Rohan is sometimes used for distributing materials. See the FAQ on the course web page if you need an account on rohan. Students may use Matlab on their own computers with the university license server or the GMCS labs.

Course Assessment and Grading
I use coarse grading. It is very difficult to justly and systematically determine that one answer is worth N points and another is worth N±ε. Consequently, points are assigned based upon broad categories that indicate your mastery of the concept:

- A+: Excellent (E)
- B: Mostly right (MR)
- ~40%: Valiant effort (VE)
- A: Good (G)
- C: Right track (RT)
- F: Not much effort

Percentage contribution of assessments to your final grade:

- Exams (40% of grade): There will be two closed book exams. The exams are non-cumulative, but the second will build on material covered in the first. Generally, I tend to emphasize concepts and you should expect short essay questions in addition to any short answer or quantitative questions. If you cannot attend an exam, contact me before the exam. No make-up exams will be permitted without prior approval.

- Problem sets (30%): Problem sets consist of questions and programming assignments, and are due at the beginning of class. Any assignments turned in after the beginning of class will be counted late. Late assignments will be accepted up to one class period after the due date with a penalty of 10% of the possible number of points. The number of problem sets varies from semester to semester, but there are typically five to six problem sets. Questions may be quantitative or qualitative in nature. For qualitative questions you are expected to give responses in grammatically correct complete sentences. For quantitative problems, you must show your work in order to receive credit.
Labs (25%): Most labs consist of a programming portion and a written report. Lab reports should be double spaced, use 11 point Times Roman font and have 1.25" margins. Excluding references, lab reports shall not exceed five pages. The purpose of the report is to help you hone your scientific writing skills and provide an opportunity to demonstrate mastery of the material. As such, lab reports are graded on both content and grammar.

Reading summaries (5%): You will be asked to read specific articles or sections of books that are not from your primary textbook. Your summary should succinctly describe the work in no more than two double spaced pages with 1.25" margins set in 11 point Times Roman type. In most cases, you will not be able to discuss the entire article; you will need to choose what is most important and summarize it in your own words.

Note on programs: Whether as part of a lab or problem set, programs must be well structured and commented. Frequently, students make their lives more difficult by simply writing the program without thinking first. The use of good program design will make your life significantly easier. In addition, an emphasis should be made on making your programs readable. Use meaningful variable names and comment as you write the program rather than adding comments at the end. If you encounter difficulties in your projects, I will assist you provided that you have made a good-faith effort to resolve the problems first. No prior experience in Matlab is expected.

Good design and structure are expected; programs do not earn grades of A simply because they work. You are not expected to comment every line nor to comment obvious lines of code (e.g. counter = counter + 1), but you must provide enough documentation such that a reasonable programmer can easily follow your code. Failure to do so will result in the program earning a lower number of points.

Schedule
The schedule for the semester is posted on the course web site. Your midterm is tentatively scheduled for Tuesday, October 13th. Your final exam will be Tuesday, December 15 from 3:30-5:30 PM in our normal class room. No early finals will be given, so if you are booking plane tickets do not schedule a date before the final exam.

Other Course Policies
Accommodations: The learning environment should be accessible to all. SDSU provides reasonable accommodations in the following situations:

- Disability: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Accommodations are not retroactive.

- Religious and official university activities (e.g., Athletics): Within the first two weeks of classes, notify your instructor of planned absences for religious or university activities. If scheduling changes occur, immediately notify the instructor.

Academic Honesty: You are free to discuss ideas and strategies for approaching problems with others, but students must complete work on their own. Using other people’s work in any form (i.e. the web, other students) will result in disciplinary action. Plagiarism is unacceptable and will not be tolerated. You are responsible for understanding plagiarism; the library has a tutorial (http://library.sdsu.edu/guides/tutorial.php?id=28). If you have any questions about plagiarism after taking the tutorial, I will be happy to assist you. My standard course of action is to report students whom I believe have cheated or plagiarized to the Judicial Procedures Office. In addition to the academic penalty (usually an F for the course), Judicial Procedures may decide upon additional sanctions such as expulsion.

Classroom policy: Turn cell-phones off before class and refrain from chatting during class as both disturb the students around you. If you find yourself unable to resist chatting, you will be asked once to be quiet. A second time will result in your being asked to leave for the day.

Conflicts/Issues:
Should you have any concerns about the course, please see me during my office hours or make an appointment and we will try to resolve the problem together. If you are not satisfied with the resolution after having discussed the issue with me, you may contact Dr. Leland Beck.

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1 If you are a LaTeX user, you can use a report format with double spacing. Some report formats have a draft option which lets you accomplish this.