CSCE 970: Pattern Recognition	**Spring Semester, 2001**

Course Information

January 8, 2001 *Handout 1*

Up-to-date information will be kept at `http://www.cse.unl.edu/~sscott/CSCE970`**.**

Prerequisites: Math 314/814 (Linear Algebra), Stat 380/880 (Prob. and Stats), and CSCE **310** (Data Struc)
Time: 11:30–12:20 Monday, Wednesday, Friday
Classroom: Ferguson 113
Instructor: Stephen D. Scott (sscott@cse), Ferguson 305, 472-6994
Instructor's Office Hours: Monday 12:30–1:30, Thursday 10:00–11:00, and by appointment
Textbook: *Pattern Recognition*, by Sergios Theodoridis and Konstantinos Koutroumbas. Academic Press, 1999.

Course Objectives

In this course you will learn several of the fundamentals and current trends in pattern recognition. Many of the approaches we will cover are applicable to several areas, including OCR, computer-aided diagnosis, speech recognition, and machine vision. The emphasized topics in this course will be classification, clustering, and system evaluation. Within these areas we will focus on approaches rooted in probability, statistics, and machine learning.

In this course we will follow the book closely, but when necessary I will supplement it with relevant technical papers. For example, when we discuss new methods in machine learning, I will provide copies of papers summarizing the results.

Homework Assignments

There will be 2–4 homework assignments, *each due by 5:00 p.m. on its due date.* These assignments will include non-computer-based problems (i.e. theoretical exercises) and computer-based problems (i.e. implementations). The former is to help you comprehend the theory and the latter is to help you understand how the theory is used in practice. No late homework submissions will be accepted. Thus it is better to submit a partially completed homework assignment than a late one. If you have a valid excuse for a late submission (e.g. illness), contact me as soon as possible.

You may consult each other for assistance on the homework, but you must acknowledge whom you consulted and on what, and write up your results in your own words. I strongly encourage you to use some document processing package (e.g. LaTeX) to write your homework submissions, and to write as clearly and concisely as possible. *Presentation of your results is as important as the results themselves.* If I cannot understand what you wrote due to poor writing, illegible writing, etc., then I cannot award full credit, even if your answers are correct.

Finally, ensure that all your files (e.g. program code, homework write-ups) are reasonably well-protected. You will be held responsible if someone copies your files and submits them to me as homework solutions.

Exams

There will be no exams in this course.

Project

In this course you will do a substantial project. This project can be: (1) a very extensive literature search and summary on a particular topic, (2) a good implementation and evaluation of a known result in pattern recognition, or (3) a small (but nontrivial) amount of original research related to pattern recognition. You may work on these projects individually or in groups of two, but if you work in a group of two, then my expectations will be much higher when I grade your project.

You will summarize your project results in a written report and an oral presentation. If your project involves an implementation, then you will also give a brief demonstration. The written report *must* use a professional

writing style similar to that found in an ACM or IEEE journal, including abstract, introduction, summary of related work, your contribution, references, and an appendix (if necessary). The oral presentation will be to the entire class at the end of the semester: during dead week (April 23–27), and if necessary, during the week prior to dead week (April 16–20). You will submit your written report to me no later than April 30 (the first day of finals week). Demonstrations will be scheduled individually no later than the first two days of finals week (May 1 and 2). In accordance with UNL dead week policies, you have now been informed in writing of the nature and scope of this project prior to the eighth week of classes.

I will provide a list of possible topics later this semester, but you may propose your own topic as well. *You must receive my approval on your topic before proceeding with your work!* To be a valid topic, it must go beyond the scope of the course. So your project could be on a topic we did not cover in class at all, or could more deeply explore a topic we covered in class.

Topic Summaries

After we complete each topic in lecture, you will submit a brief (1–3 pages) summary of that topic. This is due *one week* after I finish covering that topic in class. *No collaboration is allowed!* Your summary will be based on my lecture, the relevant readings from the text, and any other supplementary material that I hand out. Your summary should include *at least* the following: (a) an overview of the "big picture" of that topic; (b) a description of what you feel are the most and least interesting results related to that topic; (c) 2–3 questions on material that you did not understand from the readings and lectures; and (d) 2–3 interesting research ideas related to this topic. This summary *must be in your own words!* If you merely copy material from the textbook or the papers, you will be severely downgraded. Finally, as with the homeworks and projects, quality of writing and brevity will be heavily weighted in the grading.

Dumb Question Asker

Each Monday, I will select a student who will be required to ask three questions during each lecture of that week. During your assigned lectures, you may ask any question concerning any course material that you do not understand. If you completely understand the material, then you may ask any question that you feel would help the other students (even if you already know the answer yourself). If you cannot think of a question to help the rest of the class, then any "dumb question" (e.g. "Who will win the game on Saturday?") will suffice. But you must ask three questions during each of your assigned lectures.

Grading

The above items will be weighted as follows:

hwks: 35%	proj. report: 25%	proj. pres.: 15%	topic summaries: 15%	subjective: 10%

Your subjective score will be based on your fulfillment of your duties as dumb question asker as well as my impression of your effort put forth to participate in class, participate out of class, and to learn the course material. Thus actively asking questions and making comments in class and seeing me outside of class will help your grade.

In computing your letter grade I will start with the following base scale:

$\geq 90\% = \mathrm{A}$	80–89% = B	70–79% = C	60–69% = D	$\leq 59\% = \mathrm{F}$

You will receive a "+" with your grade if the last digit of your score is a 5 or higher. I will scale up from this base scale if necessary. So if you get an 85% in this class you are *guaranteed* a B+, but your grade might be higher depending on your performance relative to the rest of the class.

Plagiarism of any kind on the homeworks, project, or topic summaries will result in a course grade of F.

Suggestion Box

At `http://www.cse.unl.edu/~sscott/CSCE970/suggestion-box.shtml` is an anonymous suggestion box for this course. I encourage you to submit comments or suggestions regarding my teaching style, course content, etc. You can submit your name and e-mail address with your suggestion, but they are not required.