King Fahd University of Petroleum & Minerals

College of Computer Sciences and Engineering
Information and Computer Science Department

ICS 589: Special Topics:
Principles of Biometric Authentication (3-0-3)

Syllabus – Fall Semester 2012-2013 (121)

Website: Blackboard (WebCT) http://webcourses.kfupm.edu.sa

Class Time, Venue and Instructor Information:

Time	Venue	Instructor	Office Hours
--	--	**Dr. EL-SAYED EL-ALFY** Office: 22-108 Phone: 03-860-1930 E-mail: alfy@kfupm.edu.sa, http:faculty.kfupm.edu.sa/ics/alfy	TBA

Course Catalog Description

Overview of authentication methods and biometric technologies; Basics of signal and image analysis for biometrics; Machine learning and pattern recognition approaches for biometric authentication for major static and dynamic biometric traits such as voice, face, iris, hand-geometry, palm-print, fingerprint, signature, etc.; Multimodal information fusion; Biometric standards, databases, applications and systems security; Future of biometric systems. The course includes hands-on programming projects to develop core components of various biometric systems.

Pre-requisites: Graduate Standing

Course Objectives

Provide students with algorithmic knowledge and hands-on experience on biometric authentication systems and their real-world applications.

Course Learning Outcomes

Upon completion of the course, you should be able to:

1. Understand biometric concepts and recognize differences among different biometric technologies
2. Apply relevant computational methods for biometric authentication
3. Develop core components of biometric systems
4. Effectively use software tools and techniques to assess the effectiveness of different biometric systems

Required Material

- A. K. Jain, A. A. Ross and K. Nandakumar, Introduction to Biometrics, Springer 2011.
- S. Y. Kung, M. W. Mak, and H. S. Lin, Biometric Authentication – A Machine Learning Approach, Prentice-Hall, 2005.
- Lecture handouts and collection of selected journal/conference papers

Assessment Plan

Assessment Method	**Weight**
Class work: Hws, Quizzes, Presentations	15 %
Midterm Exam (~ 8th Week)	20 %
Project	35 %
Final Exam [TBA by the Registrar]	30 %

Tentative Schedule

Week	Topics
1	Overview of authentication methods and biometric technologies
2-4	Basics of signal and image analysis for biometrics
5-11	Machine learning and pattern recognition approaches for biometric authentication for major static and dynamic biometric traits such as voice, face, iris, hand-geometry, palm-print, fingerprint, signature, etc.
12-13	Multimodal information fusion
14	Biometric standards, databases, applications and systems security; Future of biometric systems.
15	Student project presentations

Other Course Administrativia

- *Course website & participation*: Students are required to periodically check the course website and download course material as needed. Several resources will be posted through the website as well. Blackboard/WebCT will be used for communication and interaction, posting and submitting assignments, posting grades, posting sample exams, etc. It is expected that you get benefit from the discussion board by raising questions or answering questions put by others. Students are also required to give at least one presentation during the semester other than the final project presentation.
- *Project*: Each student is required to select a research topic of interest and discuss it with the instructor for approval. Then he should go through all research phases from finding resources, reading papers, designing experiments, writing a report in professional format, and giving a presentation, etc.
- *Attendance*: Regular attendance is a university requirement; hence attendance will be checked at the beginning of each lecture and lab. Late arrivals will disrupt the class session. Missing

more than 9 lectures will result in a DN grade. To avoid being considered as absent, an official excuse must be shown no later than one week of returning to classes.

- *No makeup of homework, quizzes or exams will be given.*
- *Re-grading policy*: If you have a complaint about any of your grades, discuss it with the instructor no later than a week of distributing the grades (except for the final). Only legitimate concerns on grading should be discussed.
- *Office hours*: Students are encouraged to use the office hours to clarify any part of the material that is not clear; however the instructor will only provide hints if it is an assigned task but not solve it.
- *Academic honesty*: Students are expected to abide by all the university regulations on academic honesty. Cheating will be reported to the Department Chairman and will be severely penalized. Although collaboration and sharing knowledge is highly encouraged, copying others' work without proper citation, either in part or full, is considered plagiarism. Whenever in doubt, review the university guidelines or consult the instructor. Cheating in whatever form will result in F grade.
- *Courtesy*: Students are expected to be courteous toward the instructor and their classmates throughout the duration of this course. Talking while someone else is speaking will not be tolerated. Furthermore, all cell phones must be turned off during class and exams. In addition, students are expected to be in class on time. More importantly, you are not allowed to leave the class unless it is an urgent matter. To contact your instructor, please use email through Blackboard/WebCT whenever possible and avoid using phone calls or written notes.

⊙⊙⊙ Best luck!! ⊙⊙⊙