ISE 575 / CSCI 575 / EE 675[1]: Engineering Approaches to

Music Perception and Cognition

Epstein Department of Industrial and Systems Engineering
University of Southern California

SPRING 2005 COURSE SYLLABUS

Instructor: Elaine Chew <echew@usc.edu>
GER 245, 213.8212414
Office Hours: Thursday 3-5 PM

Section: 048-35129R
Day: Thursday 6:30-9:20pm (negotiable at first meeting)
Location: PHE223

Courseware: *http://www-scf.usc.edu/~ise575*
Text: Selected technical papers (subject to change)

Pre-requisites: Graduate standing in engineering or by instructor's consent. Programming experience (C++ or Java) and/or music knowledge desirable.

Course Objectives:

This course surveys computational research in music perception and cognition. Information processing by humans serves as a basis for improving human-computer interaction in music information systems. The topics include basic concepts of music perception and cognition, computational methods for abstracting and extracting pitch and time structures, expression synthesis, analysis and interpretation, and classification. The implementation projects in music and computing will provide hands-on practice.

Class Format, Expectation and Evaluation Method:

In general, each class will consist of a short lecture, discussion or small project presentations on a designated topic, and three to four 20-minute paper presentations.

Homework: Each student is expected to write reviews of two assigned papers (each paper is typically 10-15 pages long) every week. Occasionally, you may be given a small project or programming assignment.

Presentation: When assigned to present a paper, the student is expected to have read and understood the content sufficiently to present the problem(s) addressed and explain the approach taken and experimental findings to the class. Whenever possible, the student is expected to go beyond the paper to seek online resources and examples that illustrate the principles and algorithms introduced in the paper. Each presentation is equivalent to a short seminar, and the number of presentations will depend on the class size.

Project: For the project, each student is expected to either implement and extend the findings of one of the papers, or propose an independent music and computing project on a

[1] Approved for credit towards the MSIMS and MSEE (MCT) and the MSCSCI (MCT) degrees.

similar topic. The implementation of selected algorithms should be done in teams of no more than two. At the end of the semester, the student is expected to give a presentation to demonstrate the results of the implementation project.

The goal of this course is to acquire domain knowledge in computational music research. As such, the evaluation is based on:

Paper presentations and assignments	30%
Weekly paper reviews	40%
Final project	25%
Class participation	5%

Schedule (the rough guide)**:**

Introduction	
Week 1 (Jan 13)	Introduction
Week 2 (Jan 20)	Making Music
Week 3 (Jan 27)	Some Software for Music Programming
Week 4 (Feb 3)	Digital Representation of Symbolic Music
Musical Structures	
Week 5 (Feb 10)	Detecting Beats
Week 6 (Feb 17)	Rhythm and Meter (conducted by Anja Volk)
Week 7 (Feb 24)	Recognizing Pitch(es)
Week 8 (Mar 3)	Melody and Auditory Streaming
Week 9 (Mar 10)	Tonality and Context
Week 10 (Mar 17)	SPRING BREAK
Week 11 (Mar 24)	*Guest speaker: David Temperley*
Week 12 (Mar 31)	Grammars for Music
Interactive Music Systems	
Week 13 (Apr 7)	Generating Music
Week 14 (Apr 14)	Creating Expression
Week 15 (Apr 21)	*Guest speaker: Christopher Raphael*
Project Presentations (TBA)	

Readings will be selected from current literature, such as the Journal of New Music Research and conference proceedings of Computer Music Modeling and Retrieval, the International Conference on Music and Artificial Intelligence, the International Computer Music Conference, the International Conference on Music Perception and Cognition and the International Conference on Music Information Retrieval.

Academic Integrity Policy:

The Viterbi School of Engineering adheres to the University's policies and procedures governing academic integrity as described in SCampus. Students are expected to be aware of and to observe the academic integrity standards described in SCampus, and to expect those standards to be enforced in this course.

The Student Conduct Code appears in the Scampus and at *http://www.usc.edu/dept/publications/SCAMPUS/governance*. The USC Student Conduct Code prohibits plagiarism. Some examples of what is not allowed by the conduct code: copying all or part of someone else's work (by hand or by looking at others' files, either secretly or if shown), and submitting it as your own; giving another student in the class a

copy of your assignment solution; consulting with another student during an exam. If you have questions about what is allowed, please discuss it with the instructor.

Students who violate University standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the University. Since dishonesty in any form harms the individual, other students, and the University, policies on academic integrity will be strictly enforced. We expect you to familiarize yourself with the Academic Integrity guidelines found in the current SCampus. Violations of the Student Conduct Code will be filed with the Office of Student Conduct, and appropriate sanctions will be given.

Disability Policy Statement:

Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213)740-0776.