

Spring 2005Daniel J. Epstein Department of Industrial and Systems Engineering
University of Southern California Andrew and Erna Viterbi School of Engineering**Introduction****Week 1**

Introduction

(Jan 13)

Week 2

Making Music

(Jan 20)

Impromptu by Jeanne Bamberger and Armando Hernandez, available at www.tuneblocks.comJeanne Bamberger (2004). "The development of intuitive musical understanding: a natural experiment." *Psychology of Music* 30(1):7-30. [[PDF](#)]**Hyperscore** by Mary Farbood and Egon Pasztor, available at web.media.mit.edu/~mary/hyperscoreKevin Jennings (2004) "Computer-Mediated Music Composition - A Case Study." Special Issue of EIT - Learning with ICT for C21st. [[PDF](#)]**Week 3**

Digital Representation of Symbolic Music

(Jan 27)

MuseData by CCARH, available at www.musedata.org.Walter B. Hewlet (1997). "The MuseData Representation of Musical Information." In *Beyond MIDI: Eleanor Selfridge-Field (ed.) The Handbook of Musical Codes*. [[HTML](#)]**The Humdrum Toolkit** by David Huron, available at csml.som.ohio-state.edu/HumdrumDavid Huron (1999). "Humdrum: A Brief Tour." Ohio State University. [[HTML](#)]**GUIDO Music Notation** by the SALIERI Project group, available at www.informatik.tu-darmstadt.de/AFS/GUIDOHolger Hoos, K.A.Hamel, Kai Renz and Juergen Kilian (1998). "The GUIDO Music Notation Format - A Novel Approach for Adequately Representing Score-level Music." *ICMC:451-454*. [www.salieri.org/guido/doc.html>[PDF/PS](#)]Kai Renz and Holger Hoos (1998). "A Web-based Approach to Music Notation Using GUIDO." *ICMC:455-458*. [www.salieri.org/guido/doc.html>[PDF/PS](#)]**Week 4**

Some Software for Music Programming

(Feb 3)

OpenMusic by IRCAM, available at sourceforge.net/projects/ircam-openmusic

an object-oriented visual programming environment for music composition based on CommonLisp/CLOS

Nyquist by Roger Dannenberg, available at www-2.cs.cmu.edu/~music/music.software.html

a sound synthesis and composition language based on a Lisp syntax

Improv by Craig Sapp, available at improv.sapp.org

a C++ environment for writing programs that enable musician/computer interaction using MIDI instruments.

Musical Structures**Week 5**

Detecting Beat

(Feb 10)

Simon Dixon (2001) "Automatic Extraction of Tempo and Beat From Expressive Performances." *JNMR* 30(1). [[PDF](#)]Masataka Goto (2001). "An audio-based real-time beat tracking system for music with or without drum-sounds." *JNMR*, 30(2):159-171, 2001. [[PDF](#)]George Tzanetakis, Georg Essl, and Perry Cook (2002). "Human perception and computer extraction of beat strength." *DAFX*. [[PDF](#)]Eric Scheirer (1998). "Tempo and beat analysis of acoustic musical signals." *J. Acoust. Soc. Am.* 103(1): 588-601. [[PDF](#)]**Week 6**

Rhythm and Meter (conducted by Anja Volk)

(Feb 17)

Anja Volk. "The Generating of Metrical Hierarchies using Inner Metric Analysis" manuscript

Douglas Eck (2001). "A Positive-Evidence Model for Rhythmical Beat Induction." *JNMR* 30. pp. 187-200. [[PDF](#)]Fabien Gouyon and Simon Dixon. (to appear). "A review of automatic rhythm description systems." *CMJ* 29:1 [[PDF](#)]Anssi Klapuri, Antti Eronen and Jaakko Astola (2004). "Analysis of the Meter of Acoustic Musical Signals." *IEEE Trans. Speech and Audio Processing*. [[PDF](#), [eg](#)]

Week 7	Recognizing Pitch(es)
(Feb 24)	Samer Abdallah and Mark Plumbley (2004). "Polyphonic Music Transcription by non-negative sparse coding of power spectra." ISMIR [PDF]
	Alain de Cheveigne and Hideki Kawahara (2002). "YIN, a fundamental frequency estimator for speech and music." J. Acoust. Soc. Am. 111:1917-1930.
	Anssi Klapuri (1999). "Pitch estimation using multiple independent time-frequency windows." WASPAA.
	Malcolm Slaney and Richard F. Lyon (1990). A perceptual pitch detector. ICASSP (1):357-360 [PDF]
	Anssi Klapuri, tuomas Virtanen, Antti Eronen, Jarno Seppanen (2001). "Automatic Transcription of Musical Recordings." Workshop on Consistent and Reliable Acoustic Cues for Sound Analysis. [PDF]
Week 8	Melody and Auditory Streaming
(Mar 3)	Conklin and Anagnostopoulou (to appear). "Segmental Pattern Discovery in Music." INFORMS JoC
	Elizabeth Margulis (to appear). "A Model of Melodic Expectation." Music Perception
Week 9	Tonality and Context
(Mar 10)	(Longuet-Higgins, Krumhansl, Temperley, Shmulevich & Yli-Harja)
	Emilia Gomez (to appear). "Tonal Description of Polyphonic Audio for Music Content Processing." INFORMS JoC
	Ozgur Izmirli and Semih Bilgen (1996). "A Model for Tonal Context Time Course Calculation from Acoustical Input." JNMR 25(3).
Week 10	SPRING BREAK
(Mar 17)	
Week 11	GUEST LECTURE: David Temperley, Eastman School of Music
(Mar 24)	Melisma Music Analyzer by David Temperley and Daniel Sleator, available at www.link.cs.cmu.edu/music-analysis
	David Temperley (2004). "An Evaluation System for Metrical Models." Computer Music Journal 28 #3 (2004), 28-44. [PDF]
	David Temperley (2002). "Cognition of Basic Musical Structures." MIT Press.
Week 12	Grammars for Music
(Mar 31)	Steedman M J (1984) "A Generative Grammar for Jazz Chord Sequences." Music Perception 2:1 52-77
	Steedman M J (1996) "The Blues and the Abstract Truth: Music and Mentals Models." In: Garnham A., Oakhill J. (eds.), Mentals Models in Cognitive Science. Psychology Press, pp.305-318
	Netta Spiro (2002). "Combining Grammar-Based and Memory-Based Models of Perception of Time Signature and Phase." In C. Anagnostopoulou, M. Ferrand, and A. Smail, eds. Music and Artificial Intelligence. Berlin: Springer, pp. 183-194.
Interactive Systems	
Week 13	Generating Music
(Apr 7)	Darrel Conklin. "Music Generation from Statistical Models." AISB 2003 Symposium on AI and Creativity in the Arts and Sciences, pp 30-35. [PDF]
	Gerard Assayag, Shlomo Dubnov and Olivier Delerue (1999) "Guessing the Composer's Mind: Applying Universal Prediction to Musical Style." ICMC. [PDF]
	David Cope (1991). "Recombinant Music: Using the Computer to Explore Musical Style." IEEE Computer 24(7):22-28.
	The Continuator by Francois Pachet, available at www.csl.sony.fr/~pachet
	Francois Pachet (2003). "The Continuator: Musical Interaction with Style." JNMR 32(3):333-341. [PDF]
	Belinda Thom (2003). "Interactive Improvisational Music Companionship: A User-Modeling Approach." User Modeling and User-Adapted Interaction Journal; Special Issue on User Modeling and Intelligent Agents. [PS]
Week 14	Creating Expression
(Apr 14)	Josep Lluís Arcos, Ramon Lopez de Mantaras and Xavier Serra (1998). "SaxEx: A Case-Based Reasoning System for Generating Expressive Musical Performances." JNMR 27(3) [PS]
	Roberto Bresin (1998). "Artificial Neural Networks Based Models for Automatic Performance of Musical Scores." JNMR 27(3). [PDF/eg]
	Sundberg J, Friberg A, and Bresin R (2003) Attempts to reproduce a pianist's expressive timing with Director Musices performance rules. JNMR 32(3):317-326. [PDF]
	Werner Goebel, Elias Pampalk and Gerhard Widmer (2004). "Exploring Expressive Performance Trajectories: Six Famous Pianists Play Chopin Pieces." ICMPC8. [PDF]

Week 15**GUEST LECTURE: Christopher Raphael, Indiana University, Bloomington**

(Apr 21)

Christopher Raphael (2003). "Orchestral Musical Accompaniment from Synthesized Audio." ICMC.

Christopher Raphael (2002). "Automatic Transcription of Piano Music." ISMIR. [[PDF](#)]

Christopher Raphael (2001). "A Bayesian Network for Real-Time Musical Accompaniment." NIPS. [[PS](#)]

Week 16**PROJECTS**

(TBA)