

Electroacoustic Music II

MUS 333 01

4 credits

Tuesday & Thursday 9:00 – 10:45 AM

Location: Benildus 245 - Computer Lab

Instructor: Steven M. Miller

Office: Benildus 237

Phone: x6197

Email: smill@csf.edu

www: <http://pubweb.csf.edu/~smill>

Readings by Topic

General

Required:

James Tenney, "Computer Music Experiences, 1961-1964" in *Electronic Music Reports #1*, Institute of Sonology, Utrecht 1969

Iannis Xenakis, "Music Composition Treks" in Curtis Roads, ed. *Composers and the Computer*, William Kauffman 1985

Curtis Roads, "Improvisation with George Lewis" in Roads, ed. *Composers and the Computer*, William Kauffman 1985

Jean-Claude Risset, "Digital Techniques and Sound Structure in Music" in Curtis Roads, ed. *Composers and the Computer*, William Kauffman 1985

Digital Audio, Computer Music & Synthesis Fundamentals

Required:

Charles Dodge & Thomas A. Jerse, "Ch. 1: Fundamentals of Computer Music" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Charles Dodge & Thomas A. Jerse, "Ch. 3: Fundamentals of Digital Audio" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Charles Dodge & Thomas A. Jerse, "Ch. 4: Synthesis Fundamentals" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Recommended:

Curtis Roads and John Strawn, "Ch. 1: Digital Audio Concepts" in Roads *The Computer Music Tutorial*, MIT Press 1996

Curtis Abbott, "Ch. 2: Music Systems Programming" in Curtis Roads *The Computer Music Tutorial*, MIT Press 1996

Curtis Roads and John Strawn "Ch. 3: Introduction to Digital Sound Synthesis" in Roads *The Computer Music Tutorial*, MIT Press 1996

Optional:

Giovanni De Polli, "A Tutorial on Digital Sound Synthesis Techniques" in Curtis Roads *The Music Machine* MIT Press 1989

MUS 333 – Electroacoustic Music II
Readings by Topic

Reverberation and Spatialization

Required:

Charles Dodge & Thomas A. Jerse, "Ch. 10: Reverberation, Auditory Location, and other Sound Processing Techniques; Section 10.1: Reverberation" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Curtis Roads "Ch. 11: Sound Spatialization and Reverberation; Section: Reverberation" in Roads *The Computer Music Tutorial*, MIT Press 1996

Recommended:

Curtis Roads "Ch. 11: Sound Spatialization and Reverberation; Section: Modeling Sound Spaces" in Roads *The Computer Music Tutorial*, MIT Press 1996

James A. Moorer, "About This Reverberation Business" in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

Optional:

F. Richard Moore, "A General Model for Spatial Processing of Sounds" in Curtis Roads *The Music Machine* MIT Press 1989

John Stautner and Miller Puckette, "Designing Multi-Channel Reverberators" in Curtis Roads *The Music Machine* MIT Press 1989

F. Richard Moore, "Spatialization of Sounds over Loudspeakers" in Max V. Mathews and John R. Pierce, eds. *Current Directions In Computer Music Research*, MIT Press 1989

Gary Kendall, William Mertens, and Shawn Decker, "Spatial Reverberation: Discussion and Demonstration" in Max V. Mathews and John R. Pierce, eds. *Current Directions In Computer Music Research*, MIT Press 1989

John Pierce, "Hearing in Time and Space" in Perry Cook, ed. *Music, Cognition, and Computerized Sound*, MIT Press 1999

Pitch Shifting

Required:

Curtis Roads "Ch. 10: Basic Concepts of Signal Processing; Section: Time/Pitch Changing" in Roads *The Computer Music Tutorial*, MIT Press 1996

Patrick Bastien, "Pitch Shifting And Voice Transformation Techniques" from online source http://www.tc-helicon.com/Files/Whitepapers/Pitch_shifting.pdf accessed 16 November, 2006

Wikipedia, "Audio timescale-pitch modification" from online source http://en.wikipedia.org/wiki/Audio_timescale-pitch_modification accessed 16 November, 2006

Recommended:

Stephan M. Bernsee, "Time Stretching And Pitch Shifting of Audio Signals - An Overview" from online source <http://www.dspdimension.com/index.html?timepitch.html> accessed 16 November, 2006

Optional:

Gareth Middleton, "Time Domain Pitch Correction" from online source <http://cnx.org/content/m11711/latest/> accessed 16 November, 2006

Gareth Middleton, "Frequency Domain Pitch Correction" from online source <http://cnx.org/content/m11715/latest/> accessed 16 November, 2006

MUS 333 – Electroacoustic Music II
Readings by Topic

D. Arfib and V. Verfaillie, "Driving Pitch-Shifting And Time-Scaling Algorithms With Adaptive And Gestural Techniques" from online source
<http://www.elec.qmul.ac.uk/dafx03/proceedings/pdfs/dafx20.pdf> accessed 16 November, 2006

FM Synthesis

Required:

Charles Dodge & Thomas A. Jerse, "Ch. 5: Synthesis Using Distortion Techniques; Section 5.1: FM Synthesis" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Barry Truax, "Organizational Techniques for *c:m* Ratios in Frequency Modulation" in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

Recommended:

Curtis Roads "Ch. 6: Modulation Synthesis; Sections: Frequency Modulation, Multiple Carrier FM, Multiple Modulator FM" in Roads *The Computer Music Tutorial*, MIT Press 1996

Optional:

John Chowning, "The Synthesis of Complex Audio Spectra by Means of Frequency Modulation" in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

Dexter Morrill, "Trumpet Algorithms for Computer Composition" in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

Bill Schottstaedt, "The Simulation of Natural Instrument Tones Using Frequency Modulation with a Complex Modulating Wave" in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

John Chowning, "Frequency Modulation Synthesis of the Singing Voice" in Max V. Mathews and John R. Pierce, eds. *Current Directions In Computer Music Research*, MIT Press 1989

Martin Russ, "Chapter 5: Digital Synthesis; Section 5.1: FM" in Russ *Sound Synthesis and Sampling*, 2nd Ed., Focal Press 2004

Waveshaping

Required:

Charles Dodge & Thomas A. Jerse, "Ch. 5: Synthesis Using Distortion Techniques; Section 5.2: Synthesis by Waveshaping" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Curtis Roads "Ch. 6: Modulation Synthesis; Section: Waveshaping Synthesis" in Roads *The Computer Music Tutorial*, MIT Press 1996

Recommended:

Curtis Roads, "A Tutorial on Nonlinear Distortion or Waveshaping Synthesis" in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

Optional:

Martin Russ, "Chapter 5: Digital Synthesis; Section 5.2: Waveshaping" in Russ *Sound Synthesis and Sampling*, 2nd Ed., Focal Press 2004

Granular Synthesis

Required:

Charles Dodge & Thomas A. Jerse, "Ch. 8: Granular Synthesis" in Dodge & Jerse *Computer Music*, 2nd Ed., Schirmer 1997

Curtis Roads "Ch. 5: Multiple Wavetable, Wave Terrain, Granular, and Subtractive Synthesis; Section: Granular Synthesis" in Roads *The Computer Music Tutorial*, MIT Press 1996

MUS 333 – Electroacoustic Music II
Readings by Topic

Recommended:

Curtis Roads, “Granular Synthesis of Sound” in Curtis Roads & John Strawn, eds. *Foundations of Computer Music*, MIT Press 1985

Optional:

Martin Russ, “Chapter 5: Digital Synthesis; Section 5.4: Granular Synthesis” in Russ *Sound Synthesis and Sampling*, 2nd Ed., Focal Press 2004

Interactive Music Systems

Required:

Todd Winkler, *Composing Interactive Music*, MIT Press 1998

Historical Perspectives

Required:

Joel Chadabe, *Electric Sound*, Prentice Hall 1997
Chapters 5-11