

## Objectives

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- to connect artists with audio and acoustics technology
- to help artists explore audio and acoustics as a medium for idea communication
- to press the boundaries of audio and acoustics technology in new and artistic ways

## Academic and Research Experience

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### Education

#### **PhD in Electrical and Computer Engineering**, August 2008

The University of Texas at Austin

Dissertation Title: *Human-Based Percussion and Self-Similarity Detection in Electroacoustic Music*

Advisors: Elmer L. Hixson, Michael F. Becker

Committee: Brian L. Evans, Mark F. Hamilton, Dennis McFadden, Russell F. Pinkston

Dissertation Summary:

The goal was to create an algorithm that identifies instants in pieces of music that humans would also identify as percussive. I first collected human judgments about percussive sounds to acquire sound-event dimensions that humans use as percussive cues. I then designed a percussivity-profile algorithm using a time-domain, channel-based approach and psychoacoustic models, and tuned the input parameters to maximally match the human choices. I also used a similarity matrix combined with the percussivity-profile algorithm to find structural characteristics in the percussive sounds of electroacoustic music.

Related Coursework:

- Fundamentals of Physical Acoustics
- Nonlinear Acoustics
- Psychoacoustics
- Wavelets

#### **MS in Acoustics**, August 1997

The Pennsylvania State University

Thesis Title: *Sensitivity of a Computational Version of the Kirchhoff Integral Theorem to Surface Discretization*

Advisor: Donald E. Thompson

Committee: Victor W. Sparrow, Philip J. Morris, Jiri Tichy

Research Experience:

- Designed, implemented, validated, and determined the error associated with the surface discretization of a computational version of the Kirchhoff Integral Theorem for sound propagation from a jet engine
- Worked as a team member with Aerospace Engineering researchers to integrate results from computational-fluid-dynamics software

Related Coursework:

- Fundamentals of Acoustics
- Acoustic Data Measurement and Analysis
- Acoustics of Fluid Media
- Electro-acoustic Transducers
- Computational Acoustics
- Building Acoustics
- Techniques in Experimental Acoustics
- Mathematical Methods in Engineering

## Academic Awards

- Acoustical Society of America Student Paper Award in Musical Acoustics, 2004 and 2007
- George J. Heuer Fellowship, 2003
- Arthur H. Hausman Endowed Graduate Fellowship in Engineering, 1999–2001
- University of Texas Thrust Fellowship, 1998

## Professional Affiliations

- International Conference on Music Information Retrieval, 2008
- Acoustical Society of America, member 1992–current
- Audio Engineering Society, member 1993–current  
Vice-Chair of the Central Pennsylvania Chapter, 1994–1995

## Engineering and Computer Experience

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### Related Experience in the Academic Environment

- Designed and implemented a rudimentary graphical-score system for electroacoustic music
- Designed a real-time, HRTF-based auralization system for a virtual-reality system
- Implemented a head-tracking system for a virtual-reality system
- Designed and implemented a data-sonification system to accompany a computer-visualization system
- Expert subject for company that tested hearing protectors
- Group Design Project: Model Car Control (microprocessor specialist)
- Individual Design Project: Digital Signal Processing for Sound Synthesis on a NeXT Computer
- Coursework:
  - Data Structures in C++
  - Digital Signal Processing
  - Operating System Programming
  - Microprocessor Programming
  - Hardware Description Language

## Computer, Laboratory, and Other Skills

- Operating Systems: Linux, Mac OS X, and Windows
- Current Computer Languages: C/C++, Matlab, Fortran, L<sup>A</sup>T<sub>E</sub>X, PHP, CSS, HTML, bash
- Music Programming Languages: Csound, ChuckK, Max/MSP, Pure Data
- Other Computer Languages: Lisp, Ada, M4, Verilog, Pascal, 8088 assembly, Cobol, Basic
- Workshop Skills: wood and metal tools; table, power, and hand tools; circuit layout, breadboarding, circuit-board etching, and soldering

## System Administrator of High Performance Computing Linux Cluster, 2004–2008

Mechanical Engineering Department, The University of Texas at Austin

- Managed a 37-computer Linux cluster including eight external servers for authentication, home directory, email, mailing list, printing, web, license manager, and backup services
- Transitioned the cluster from a desktop-accessible lab to a rack-based, remotely accessible resource (This process included hardware purchase, installation, and configuration of the new hardware. I also designed and implemented a transition plan to retire the old hardware.)
- Managed the external mailing lists for the ME Department

## Teaching Experience

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**Teaching Assistant for Senior Design Laboratory**, Spring and Summer Semesters, 2000–2004  
Electrical and Computer Engineering Department, The University of Texas at Austin

- Instructed, graded, and guided students through the design, implementation, documentation, and presentation of senior design projects
- Mentored groups based on their interest in acoustics and audio, but I also instructed groups focused on DSP, power, software, microprocessor control, antennas, user-interface design, control systems, and hardware reliability
- During the last two years of this position, I was assigned groups who formed larger teams with Mechanical Engineering senior design groups to construct cross-disciplinary projects with broader scope
- Semester Enrollment: 10–17 senior ECE undergraduates

**Instructor, *Acoustics for Musicians and Recording Engineers***, Fall Semesters, 1999–2001  
Mechanical Engineering Department, The University of Texas at Austin

- Designed, taught, and graded this general-elective class
- Guided class tours of research, performance, and recording spaces around Austin, Texas
- Created animation and images to help students understand acoustics
- Student evaluation scores were extremely good (average of 4.7 out of 5.0)
- Semester Enrollment: 18–30 undergraduate students of all majors and levels of technical ability

## Music, Dance, and Performance Experience

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- Musical background and performances in electronic music, 1991–2005; hand drum, 1995–2007; musical theater, 2004; and guitar, 1984–current
- Dance background through coursework; individual performances, 1995–2005; and as member of the Juwonka Dance Group, 1993–2000
- Designed Audio for student theatre: *Blind Horses*, 1999; and *Marisol*, 2000
- Co-curator of *Series 28*, a monthly performance art exhibition at Movements Art Gallery, Austin, Texas, 1997–1999
- Undergraduate Individual Design Project: Sound Design for Film
- Related Coursework:
  - Computer Music
  - Music in the Western World
  - West African Drumming
  - Modern Dance
  - Improvisational Dance
  - Electronic Media Projects
  - Film

## Other Interests

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- Fluent in Esperanto and active member in the Universal Esperanto Association, Esperanto-USA, and Texas Esperantists, 2003–current
- Go enthusiast and active member of the American Go Association, 1999–current
- Physical fitness through dance, bicycling, running, soccer, and yoga.