

# David V. Anderson

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## EDUCATION

**Ph.D.**—Ph.D. candidate in **Electrical Engineering**

**Thesis:** *Audio Signal Enhancement Using Multi-Resolution Sinusoidal Modeling.*

Georgia Institute of Technology (Georgia Tech), Atlanta, Georgia.  
Anticipated graduation Fall 1998.

**M.S.** in **Electrical Engineering** with an emphasis in Signal Processing.

**Thesis:** *Model Based Development of a Hearing Aid.*  
Brigham Young University, Provo, Utah, April 1994

**B.S.** in **Electrical Engineering** *magna cum laude.*

Minors in **Math** and **Physics.**  
Brigham Young University, Provo, Utah, August 1993.

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## OBJECTIVE

Position doing research in speech and audio signal processing, psychoacoustics, adaptive filtering, signal modeling, wavelet applications and/or general DSP.

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## RESEARCH

*Speech signal modeling:* Thesis research includes the development and application of a multirate sinusoidal model for speech and audio. This model provides the flexibility of sinusoidal modeling with the perceptual and signal representation advantages of a multi-resolution (wavelet) approach.

*Speech enhancement:* Current research also includes various forms of speech enhancement including background noise suppression, intelligibility improvement, signal modification for language-learning disabled children, and signal representations which are robust to noise, equalization, and/or compression. The noise suppression and robust signal representation algorithms both have been implemented in real-time, commercial wireless and teleconferencing systems.

*Computer enhanced education:* Computers are becoming ubiquitous but few know how to use them effectively in teaching. This research is part of a large effort to restructure teaching methodologies at Georgia Tech to effectly integrate computers.

*Human auditory process model:* Masters thesis research involved the development of a model of the human auditory system for use in signal processing. Results lead to the development of a commercial hearing aid as well as an increased understanding of the mechanisms of the ear.

*Hearing aid implementation and evaluation:* Real-time implementation and evaluation of the hearing aid resulting from my masters thesis. This follow-up research and consulting was performed for Sonix Technologies, Inc. and in conjunction with the Brigham Young University Audiology Clinic.

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- PUBLICATIONS**
- [1] D. V. Anderson, D. M. Chabries, R. W. Christiansen, “A model for loudness perception and the unification of loudness perception laws,” *submitted to IEEE Transactions on Speech and Audio Processing*,
  - [2] D. V. Anderson, D. M. Chabries, R. W. Harris, “A model based hearing aid,” *submitted to IEEE Transactions on Speech and Audio Processing*,
  - [3] D. V. Anderson, M. A. Clements, “Audio signal noise reduction using multi-resolution sinusoidal modeling,” *to appear at the October 1998 meeting of the Acoustical Society of America*,
  - [4] J. H. McClellan, R. W. Schafer, M. A. Yoder, “DSP First—A Multimedia Approach,” Prentice Hall, 1998. Assisted in the preparation of the CD-ROM accompanying the text and the laboratory projects.
  - [5] D. V. Anderson, J. H. McClellan, R. W. Schafer, J. B. Schodorf, “DSP First—A First Course in ECE,” *Proceedings of the 1996 Asilomar Conference on Circuits, Systems, and Computers, Pacific Grove, CA 1996*.
  - [6] D. V. Anderson, “Speech analysis and coding using a multi-resolution sinusoidal transform,” *1996 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*,
  - [7] D. V. Anderson, R. W. Harris, and D. M. Chabries, “Evaluation of a hearing compensation algorithm,” *1995 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*,
  - [8] D. M. Chabries, D. V. Anderson, T. G. Stockham, Jr., and R. W. Christiansen, “Application of a human auditory model to loudness perception and hearing compensation,” *1995 IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*,
  - [9] D. V. Anderson, *Model Based Development of a Hearing Aid*, Master’s Thesis, Brigham Young University, Provo, Utah, April 1994.

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### HONORS & MEMBERSHIPS

Georgia Tech President’s Fellowship  
National Science Foundation Graduate Fellowship: Honorable Mention  
The Outstanding Graduate Teaching Assistant—  
School of Engineering, Georgia Tech, 1997  
Georgia Tech Center for Excellence in Teaching and Learning—  
Outstanding Graduate Teaching Assistant Award for 1997  
Member Acoustical Society of America  
Tau Beta Pi National Honor Society  
Eagle Scout Award  
Member IEEE, IEEE Signal Processing Society, IEEE Education Society

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<b>EXPERIENCE</b>	<u>Teaching/Course Development</u> —Assisting in the development and teaching of an introductory signals and systems course. Emphasis is on problem visualization using MATLAB and online demonstrations. Georgia Tech, School of Electrical Engineering, Supervisors: Dr. Ronald Schafer and Dr. James McClellan
1995-present	
1995-present	<u>Consulting</u> —Signal processing software development for subject testing. Georgia State University Infant Hearing Laboratory, Supervisor: Dr. Marsha Clarkson.
1994-present	<u>Research</u> —Speech signal processing research. Georgia Tech, School of Electrical Engineering, Advisor: Dr. Mark Clements.
1997-present	<u>Consulting</u> —General speech enhancement for teleconferencing applications. ASPI Digital, Atlanta, GA.
1996-1997	<u>Consulting</u> —General speech enhancement for wireless telephone systems. Clearline, Inc., Stone Mountain, GA.
1994	<u>Consulting</u> —Digital hearing aid development and evaluation. Sonix Technologies, Inc., Salt Lake City, UT.
1991-1994	<u>Research</u> —Speech and acoustic signal processing research. Brigham Young University, Electrical Engineering Department. Advisors: Dr. Richard Christiansen and Dr. Douglas Chabries.
1993	<u>Teaching</u> —Course development and teaching of a graduate level signal processing laboratory course. Brigham Young University, Electrical Engineering Department. Supervisor: Dr. Richard Christiansen.

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## ADDITIONAL SKILLS & EXPERIENCE

### Technical Skills

- Technical writing
- Assembly language DSP programming experience
- Extensive C/C++ programming and UNIX experience, also JAVA experience

### Leadership/Management Experience

- Co-President, Georgia Tech Chapter of the IEEE Signal Processing Society
  - Organizer of Georgia Tech DSP Colloquium
  - BYU Student Advisory Council & BYU Bookstore Advisory Committee
  - College Council for BYU College of Engineering and Technology
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