Ron J. Weiss

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Current position

PhD candidate in the department of Electrical Engineering at Columbia University. Graduate research assistant at the Laboratory for the Recognition and Organization of Speech and Audio (LabROSA) under the supervision of Prof. Daniel P. W. Ellis.

Research interests

Source separation
Noise robust speech recognition
Music information retrieval
Machine learning

Education

2009 May (exp) PhD in Electrical Engineering, Columbia University

- Thesis topic: Underdetermined source separation using speaker-adaptive models

2007 Oct MPhil in Electrical Engineering, Columbia University

2005 May MS in Electrical Engineering, Columbia University

- GPA: 3.9/4.0
- Relevant course work: Speech and Audio Processing and Recognition, Advanced Machine Learning, Speech Recognition, Detection / Estimation Theory

2004 May BS in Computer Engineering, Columbia University

- GPA: 3.9/4.0, Major GPA: 4.1/4.0
- Relevant course work: Music Signal Processing, Digital Image Processing

Publications

R. J. Weiss, M. I. Mandel, and D. P. W. Ellis, "Source separation based on binaural cues and source model constraints," in *Proceedings of Interspeech*, (Brisbane, Australia), pp. 419–422, September 2008.

R. J. Weiss and T. Kristjansson, "DySANA: Dynamic speech and noise adaptation for voice activity detection," in *Proceedings of Interspeech*, (Brisbane, Australia), pp. 127–130, September 2008.

R. J. Weiss and D. P. W. Ellis, "Speech separation using speaker-adapted eigenvoice speech models," *Computer Speech and Language*, 2008.

R. J. Weiss and D. P. W. Ellis, "Monaural speech separation using source-adapted models," in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, (New Paltz, NY), pp. 114–117, October 2007.

R. J. Weiss and D. P. W. Ellis, "Estimating single-channel source separation masks: Relevance vector machine classifiers vs. pitch-based masking," in *Proceedings of the ISCA Tutorial and Research Workshop on Statistical and Perceptual Audition (SAPA)*, (Pittsburgh, PA), pp. 31–36, September 2006.

D. P. W. Ellis and R. J. Weiss, "Model-based monaural source separation using a vector-quantized phase-vocoder representation," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, (Toulouse, France), pp. V–957–960, May 2006.

Patents

"Speech Detection", co-inventor with Trausti Kristjansson, covers DySANA algorithm for signal-to-noise ratio adaptive voice activity detection, filed Mar 2008.

Experience

2004 – present **Columbia University**, Graduate Research Assistant, LabROSA

- Studied applications of machine learning to underdetermined source separation.
- Studied music signal analysis and algorithmic composition.
- Developed MEAPsoft software package for audio/music reorganization (available at `http://labrosa.ee.columbia.edu/meapsoft`)

2007 Jun – Sep **Google, Inc.**, Software Engineering Intern

2008 Jan – Mar

- Studied voice activity detection (VAD) algorithms to improve performance of Goog411 speech recognition in noisy conditions.
- Developed speech endpointing evaluation framework in Python.
- Developed novel VAD algorithm that adapts to changing environmental noise conditions (see related publication and patent above).

2003 Fall **Columbia University Multimedia Signal Processing Lab**, Research Assistant

- Explored the feasibility of designing low power MPEG-4 video processors based on the logarithmic number system.
- Performed software simulations of MPEG-4 video encoder/decoder and evaluated testing procedures.

2003 May – Aug **Desktop Laboratories, Inc.**, Software Engineer

- Developed elementary school math and science education software using LabVIEW.
- Assisted in development of web-based product registration system in PHP.

2002–2003 May **Columbia University Department of Computer Science**, Systems Administrator, Central Research Facility

- Assisted in maintenance of the compute resources for the CS department.
- Maintained 500+ Sun Solaris, Microsoft Windows, and RedHat Linux machines including user accounts, backups, upgrading and installing software, security, and printers.
- Managed DHCP, DNS, NIS, NFS, and mail systems.

Teaching

2007 Spring Co-lecturer: ELEN E4896 - Music Signal Processing

2005 Spring Teaching Asistant: ELEN E4896 - Music Signal Processing

2004 Fall Teaching Assistant: ECBM E4060 - Introduction to Genomic Information Systems

2003 Fall Teaching Assistant: COMS W4118 - Operating Systems I

Skills

Software design and implementation in Java (including Swing and Audio libraries), Matlab, C/C++ , Python, Perl, UNIX shell scripting.

	Unix/Linux system administration (10 years).
	Facility with GNU programming tools, MS Windows, LaTeX, Emacs

Other contributions

Awards	Department of Electrical Engineering Teaching Fellowship, 2004-2005
	Inducted into Tau Beta Pi engineering honor society, 2003
	Columbia University Dean's List, 2000 – 2002
Reviews	IEEE Transactions on Audio Speech and Language Processing, 2007, 2008
	IEEE International Conference on Audio Speech and Signal Processing, 2006–2008
	International Symposium on Music Information Retrieval, 2006, 2007
	ISCA Workshop on Statistical and Perceptual Audio Processing, 2006, 2008
Associations	IEEE Student member since 2005

New York, October 30, 2008