

## JOSEPH G. DESLOGE

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### EDUCATION

Ph.D., Electrical Engineering, M.I.T., 1998. Dissertation Title: *The location-estimating, null-steering (LENS) algorithm for adaptive microphone-array processing.*

S.M., Electrical Engineering, M.I.T., 1994.

B.S., Electrical Engineering, Cornell University, 1992.

### EXPERIENCE

Research Scientist, Sensimetrics Corporation, November 1999 – present.

1: Co-designed and implemented both immersive and non-immersive hearing loss and prosthesis simulation systems. The immersive system employed a separate DSP system to process ambient sounds in real time while the non-immersive system processed audio/visual files in real time. 2: Designed systems to re-introduce spectral source localization cues into a hear-through earmuff system. 3: Studied the effects of reverberation upon microphone array processing systems and developed novel array processing and de-reverberation techniques based upon this study. 4: Implemented and evaluated array processing algorithms for a ‘smart’ hearing protector application that preserves target location speech sounds while reducing non-target location industrial sounds. (Matlab simulation, Motorola DSP56303/DSP56L307 assembly coding, Windows C/C++ programming.)

Research Affiliate, Research Laboratory of Electronics – M.I.T., April 2006 – present.

Designed, programmed, and implemented a hearing loss simulation platform for conducting psychophysical experiments with hearing-impaired and simulated-loss normal-hearing subjects. (Matlab simulation, C/C++ programming.)

Research Scientist, Research Laboratory of Electronics – M.I.T., September 1998 – December 2000.

Designed and simulated a battlefield surveillance system that separates out all sound sources in complex acoustic environments and presents these separated sources to a human listener in a useful and understandable manner. Design included modification and improvement of existing adaptive array processing algorithms. Implementation of this system is ongoing. (Matlab simulation, C and C++ programming, Texas Instruments TMS320C6201 DSP assembly coding.)

Research Scientist, Research Laboratory of Electronics – M.I.T., September 1998 – October 1999.

Implemented and tested a novel adaptive microphone array processing algorithm (LENS) for the application of background noise reducing hearing aids. (Matlab DSP interface, C programming, Motorola DSP96000 coding.)

Summer Intern, Hughes Space and Communication, June 1997 - August 1997.

Programmed an end-to-end simulator of the digital signal processing (DSP) of the payload for a mobile communications satellite system. Included bit-true arithmetic simulation of A/D and D/A converters, FIR filter banks, and FFTs. (Signal Processing Workstation simulation.)

### PUBLICATIONS

Desloge, J.G., Rabinowitz, W.M., and Zurek, P.M. (1997). “Microphone-array hearing aids with binaural output. I. Fixed-Processing Systems,” *IEEE Transactions of Speech and Audio Processing* **5**, 529-542.

Welker, D.P., Greenberg, J.E., Desloge, J.G., and Zurek, P.M. (1997). “Microphone-array hearing aids with binaural output. II. Adaptive-Processing Systems,” *IEEE Transactions of Speech and Audio Processing* **5**, 543-551.

Desloge, J.G. (1998). “The location-estimating, null-steering (LENS) algorithm for adaptive microphone-array processing,” Ph.D. Thesis, Department of Electrical Engineering and Computer Science, M.I.T.

Greenberg, J.E., Desloge, J.G., and Zurek, P.M., ‘Evaluations of Array Processing Algorithms for a Headband Hearing Aid,’ *J. Acoust. Soc. Am.* **113**(3), March 2003, 1646-1657.

Shinn-Sunningham, B.G., Desloge, J.G., and Kopco, N. (2001), “Empirical and modeled acoustic transfer functions in a simple room: Effects of distance and direction,” in *Proceedings of the 2001 IEEE Workshop of Applications of Signal Processing to Audio and Acoustics*, New Paltz, NY, 19-24 October 2001, 419-423.

### PROFESSIONAL ACTIVITIES

Member: IEEE, Sigma Xi, Tau Beta Pi, Eta Kappa Nu.