

Obituary

Ann Kristen Syrdal, 1945–2020



Ann Kristen Syrdal passed away on July 24, 2020, at her home in San Jose, CA. In a career spanning five decades, Ann made outstanding contributions to our understanding of human speech perception and to the development of natural-sounding text-to-speech (TTS) synthesis.

Ann received her PhD in psychology from the University of Minnesota (Minneapolis) in 1973, concentrating on human speech perception. Categorical perception, the way human listeners partition a continuum of varying acoustic patterns into discrete linguistic categories, drove Ann's early work as did the *invariance problem*: how vastly different acoustic patterns such as speech uttered by a young child and an adult male can be mapped to the same linguistic elements. Working with colleagues at Haskins Laboratories and in her dissertation, Ann explored categorical perception for stop consonants using speech synthesis to generate stimuli, contributing to our understanding of phoneme recognition. Additionally, Ann collaborated with then-husband Robert Lasky, demonstrating that universal categorical perception in young infants must later be "tuned" to the specifics of the infant's native language.

One of Ann's most important contributions, supported by a National Institutes of Health Career Development Award, addressed the invariance problem and speaker-independent classification of vowels. Syrdal and Gopal presented a model in which differences measured on a Bark scale between a speaker's fundamental frequency and pairs of formants leads to the accurate classification of vowels in the front-back and high-low dimensions used to describe vowels in articulatory phonetic terms.

Ann moved to AT&T Bell Labs in Naperville, IL, where she worked on aspects of speech synthesis, including duration modeling and, most importantly, developing the first female synthetic voice, work for which she was

eventually honored by being made an Acoustical Society of America (ASA) Fellow. For her applied research, she was honored as a Distinguished Member of the Technical Staff. This work also informed a volume on applied speech technology that sampled most evolving applications of speech technology and reflected her particular interest in the use of speech technology in assistive communication aids for persons with sensory or motor deficits that present challenges to auditory or oral communication.

Later, Ann joined the AT&T Next-Gen TTS project, developing state-of-the-art natural-sounding corpus-based speech synthesis. Ann guided the preparation of large speech corpora, designed voices, and carried out detailed experimental evaluations that led to higher quality. The results of the work included new high-quality female voices and an African American TTS voice. The system was commercialized and enjoyed lasting success under the product name AT&T Natural Voices. Ann also led the ASA committee that developed the American National Standards Institute (ANSI)/ASA standard on evaluating the intelligibility of TTS systems. Ann was a wonderful friend to many AT&T colleagues and mentor to young researchers.

Selected Publications by Ann Kristen Syrdal

- Beutnagel, M., Conkie, A., Schroeter, J., Stylianou, Y., and Syrdal, A. (1999). The AT&T Next-Gen TTS system. In *Proceedings of the Joint meeting of the Acoustical Society of America (ASA), European Acoustics Association (EAA), and German Acoustics DAGA Conference*, Berlin, Germany, March 14-19, 1999, pp. 18-24. <https://acousticstoday.org/SyrdalATT>.
- Lasky, R. E., Syrdal-Lasky, A., and Klein, R. E. (1975). VOT discrimination by four to six and a half month old infants from Spanish environments. *Journal of Experimental Child Psychology* 20(2), 215-225.
- Mattingly, I. G., Liberman, A. M., Syrdal, A. K., and Halwes, T. (1971). Discrimination in speech and nonspeech modes. *Cognitive Psychology* 2(2), 131-157.
- Syrdal, A. K., Bennett, R. W., and Greenspan, S. L. (Eds.) (1994). *Applied Speech Technology*. CRC Press, Boca Raton, FL.
- Syrdal, A. K., and Gopal, H. S. (1986). A perceptual model of vowel recognition based on the auditory representation of American English vowels. *The Journal of the Acoustical Society of America* 79(4), 1086-1100.

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