



SPEECH RESEARCH IN TELECOMMUNICATIONS: A BELL-CENTRIC VIEW

Biing-Hwang (Fred) Juang

Georgia Institute of Technology, USA

ABSTRACT

Speech research aiming at developing technologies to enhance telecommunications has produced many remarkable results in the past five decades. In various branches of the field, many breakthrough technologies were brought about due to courageous paradigm shifts advocated by few. In this talk, we highlight the progress in speech processing technologies, particularly from a historical perspective as seen from Bell Laboratories, and point out these paradigm shifts in hope to inspire more technical breakthroughs.

ABOUT THE SPEAKER

Professor Biing-Hwang (Fred) Juang received his Ph.D. from University of California, Santa Barbara in 1981. He had worked at Speech Communications Research Laboratory (SCRL) and Signal Technology, Inc. (STI) on a number of Government-sponsored research projects. Notable accomplishments during the period include development of vector quantization for voice applications, voice coders at extremely low bit rates, 800 bps and around 300 bps, and robust vocoders for use in satellite communications. He was also a co-Principal Investigator for the project on co-channel separation of speech signals. He subsequently joined the Acoustics Research Department of Bell Laboratories, working in the area of speech enhancement, coding and recognition. Prof. Juang became Department Head/Director of Acoustics and Speech Research at Bell Labs in 1996, and Director of Multimedia Technologies Research at Avaya Labs (a spin-off of Bell Labs) in 2001. In the past few years, he and his group developed a speech server for applications such as AT&T's advanced 800 calls and the Moviefone, the Perceptual Audio Coder (PAC) for digital audio broadcasting in North America (in both terrestrial and satellite systems), and a world-first real-time full-duplex hands-free stereo teleconferencing system. Prof. Juang joined Georgia Institute of Technology in 2002 as Motorola Foundation Chair Professor in the School of Electrical and Computer Engineering. He is also an Eminent Scholar of Georgia Research Alliance of the State of Georgia. Prof. Juang has published extensively, including the book "Fundamentals of Speech Recognition", co-authored with L.R. Rabiner, and holds about twenty patents. He has served as Editor-in-Chief for the IEEE Transactions on Speech and Audio Processing, and a number of positions in the IEEE Signal Processing Society, including the current Chair of its Fellow Reference Committee. He is currently on the IEEE Proceedings Editorial Board. Prof. Juang has received a number of technical awards, notable among which are several Best Paper awards in the area of speech communications and processing, the Technical Achievement Award from the Signal Processing Society, and the IEEE Third Millennium Medal. He is a Fellow of the IEEE, a Fellow of Bell Laboratories, and a member of the National Academy of Engineering of the United States.