Articulatory strategies, speech acoustics and variability. Carol Espy-Wilson, Dept. of Electrical and Computer Engineering and Institute for Systems Research, University of Maryland, College Park, Maryland, USA. [Full Paper Available on CD]

The study of speech acoustics is vital for understanding the relationship between articulation and the physical properties of the speech signal. Speech acoustics reveals stable characteristics of the speech signal and systematic ways in which the speech signal can vary due to coarticulation, speech style and differences in articulatory strategies that exist across speakers. In this talk, vocal tract models of some of the alternative strategies used by speakers to produce American English /r/s are discussed to show (1) stability of perceptually important acoustic properties due to consistencies in articulation and (2) variability in other acoustic properties that may serve as signatures for the differences in individual vocal tract sizes and shapes. Another example of alternative strategies used by speakers is discussed in the framework of tradeoffs between the glottal and supraglottal sources used in the production of voiced obstruents. Speaker differences are revealed through acoustic analysis of the relative amounts of periodic and aperiodic energy in the speech signal. Understanding such speaker-specific variability as well as those properties that are relatively stable across speakers is important for the effective development of speech communication systems.