

Department of Communications and Computer Engineering
CCE5223 - Speech Processing and Coding

Tutorial 1
Articulatory Phonetics

1. Briefly explain the difference between nasal consonants and fricative consonants in terms of
 - (a) how they are produced physically
 - (b) their acoustic characteristics
2. Consider the phoneme sequence /ame/
 - (a) Describe how the formants below 3kHz would behave on a wideband spectrogram of this utterance
 - (b) How would the formant bandwidths change during the utterance?
 - (c) When and where do spectral zeroes appear in this utterance?
3.
 - (a) Name all consonants that explicitly use one or both of the lips.
 - (b) What common acoustic features do these consonants have?
 - (c) What acoustic features are different and can be used to distinguish among these consonants. (To discriminate each pair of these consonants)
4. How are the consonants /m/ and /n/ different from the oral vowels? Where are the positions of the poles and zeroes in the transfer function of the vocal tract up to 5 kHz for /m/ and /n/?
5. Describe the acoustic and articulatory features of /b/, /d/, and /g/. What acoustic properties of the speech signal distinguishes these phonemes from others?
6. Distinguish between a narrowband and a wideband spectrogram and give typical applications where one is preferred over the other.
7. Describe the articulatory properties that produce vowel sounds. How are vowel sounds distinguished between them.
8. What is the spectral envelope of voiced speech? Describe a method to obtain the spectral envelope from a frame of voiced speech.