

Assignment 1: Recording and analysis of American English vowels

- (1) Record the set of 12 vowels / i I e ε æ ʌ ə ɔ ʊ u / plus the 3 diphthongs / ai au ɔi / in hVd words in a carrier sentence, “Please say the word _____ again.”
- (2) Perform an acoustic analysis of the vowel portion. Use the WaveSurfer program to position cursors on the onset and offset of the syllable, and the onset and offset of the vocalic (voiced) part of the vowel. Store the locations of the cursors (time sample points) for further analysis.
- (3) Use the WaveSurfer program to measure the duration of the complete syllable as well as the vocalic portion. Measure the formant frequencies (F1, F2, F3) and fundamental frequencies of the vocalic portion (plus vowel duration). Import the measurements into Matlab and create summary plots (details to be provided later).
- (4) Repeat the measurements obtained with WaveSurfer using TrackDraw, a graphical formant tracking program. Use TrackDraw to synthesize the tracks and listen to the result to confirm the accuracy of the measurements. Make notes of any measurement errors, difficult cases or discrepancies between the two approaches.
- (5) Compare the formant measurements with the published data for Western Michigan in Hillenbrand et al. (1995) and for N. Texas in Assmann & Katz (2000).
- (6) Use the measurements to train and test a statistical pattern classifier.
- (7) Test the predictions of the model against vowel identification performance by listeners.

i	heed	ai	hide
I	hid	au	how'd
e	hayed	ɔi	hoyed
ε	head		
æ	had		
ʌ	hud		
ə	herd		
ɑ	hod		
ɔ	hawed		
o	hoed		
ʊ	hood		
u	whod		