## Acoustics of Speech and Hearing

Lecture 2-5 Formant Transitions

## Overview

- Stationary vs Dynamic Sounds
- Diphthongs
- Approximants
- Acoustic consequences of obstructions – Formant transitions
- Manner Series









## Approximants

- Generally
  - Differ from vowels in that articulations are more *extreme*
  - Differ from diphthongs in that transitions are more *rapid*



## Obstruction in Vocal Tract

- Open
  - tube has clear resonances, excited by sound generated at larynx
- Obstructed
  - only cavity in front of obstruction available to shape sound
  - $\mbox{ any sound generated at larynx can't get out}$
  - lack of air-flow eventually stops vocal fold vibration

























- Dynamic sounds caused by changing vocal tract
- Changing vocal tract causes formant movements or 'transitions'
- Formant transition shape depends on vowel and consonant
- Characteristics of formant transitions give 'cues' to consonant place and manner



• Your recordings of

- Study change in spectrographic pattern with change in manner
- Build a poster of a "key" for identifying these sounds from their spectrogram