For over 50 years, variation in the speech signal has been an overarching issue in phonetic research. Phoneticians assume that important aspects of variation are systematic rather than random and we aim for theories whose principles account for, and predict, these systematically variable phonetic realizations.

This course explores four "hot topics" in speech production, acoustics, and perception centered on the broad theme of variation. Our overall goals are to further develop students' grasp of foundational phonetic principles, to introduce you to important theoretical innovations and debates, and to strengthen your skills in instrumental and modeling techniques related to the study of sound structure.

Exemplar-based models of speech perception and production capitalize on findings that show that speakers/listeners have knowledge of the details of phonetic variation. We begin the course with an introduction to exemplar-based models in phonetics, assessing their strengths and weaknesses and comparing them to alternative (abstractionist) approaches. Exemplar-based models have perhaps been most successfully applied to socially motivated phonetic variation; investigation of current research in this area is our second topic.

The third and fourth topics are organized around the study of gestural coordination and overlap. A major theoretical issue in this area involves understanding the relative contributions of the speech motor system (biomechanics) and speech perception (recoverability) to variable patterns in gestural timing. We will explore this issue with a focus on ultrasound research. (That investigation will include working with our lab's ultrasound system, with the plan being for the class to collect and analyze a small ultrasound corpus.) Finally, we will turn to very recent modeling techniques for "unmasking" the sources of gestural overlap (coarticulation) in the acoustic signal.

The course assumes background knowledge of phonetics (Ling 512 or its equivalent).

**Course requirements**
- Active participation in weekly meetings that shows you have read and thought about the readings in relation to the study questions;
- Primary responsibility for one week's discussion topic;
- Timely preparation for, and active participation in, the small-scale ultrasound experiment;
- A term paper involving a detailed prospectus for an experimental study or, for students who are already conducting a project, a write-up of a portion of that work. The paper should be modeled on published research papers in phonetics and include (a) an introduction that situates your study within the relevant literature and outlines its theoretical grounding, (b) the methods of the proposed or actual experiment, and (c) a description of possible—or presentation of obtained—results and their implications.
Syllabus

Introduction
Week 1 (Sept 7): Setting the stage:
background, overview of current issues in phonetic theory, identifying participants' main interests, and course goals

Exemplar-based models of speech production and perception
Lahiri & Marslen 1991
Week 3 (Sept 21): Pierrehumbert 2001, Cutler et al. in press, Ettlinger & Johnson 2009,
Pallier et al. 2001

Phonetic convergence and accommodation
Week 4 (Sept 28): articulatory convergence
Week 5 (Oct 5): articulatory convergence
Babel 2009
Week 6 (Oct 12): perceptual accommodation

Gestural coordination and overlap: articulation (especially ultrasound imaging)
Week 7 (Oct 26): theoretical issues in gestural coordination and overlap
Week 8 (Nov 2): ultrasound – methods and technical issues
Stone 2005, Whalen et al. 2005
Week 9 (Nov 9): laterals
Giles & Moll 1975, Recasens & Espinosa 2010(a,b), Wrench & Scobbie 2003
Week 10 (Nov 16): within-segment gestural coordination (liquids and nasals)
Week 11 (Nov 23): more on ultrasound
Davidson 2005, Davidson 2006

Gestural overlap: acoustic modeling techniques for assessing coarticulatory effects
Week 12 (Nov 30): vowel-to-vowel coarticulation

Pulling it all together: a return to exemplar models
Week 13 (Dec 7): no readings

Student presentations
Wed Dec. 15
Course Readings


