



## Spline Smoothing with Applications to Tongue Shape Data Analysis

Yuedong Wang

University of California - Santa Barbara, Santa Barbara, USA - yuedong@pstat.ucsb.edu

Ultrasound images provide real time information about the shape of the tongue body at different stages in articulation. In linguistic studies, researchers may want to determine whether the tongue shape for an articulation under two different conditions is the same or different. This presentation illustrates how the smoothing spline methods can be applied to estimate and compare tongue shape curves and surfaces. The methodologies are general which could be applied to other areas of research.

**Keywords:** functional data; linguistics; smoothing spline ANOVA; ultrasound image.