ESTIMATING GEOMETRIC MODELS OF CHOICE AND JUDGMENT

Keith Poole, University of Georgia

Course Description

This course is concerned with methods of estimating latent dimensions of preference and similarity from individuals' observed choices and judgments. Factor Analysis, Multidimensional Scaling, and related techniques are studied both with classical maximum likelihood and Bayesian methods. Given either similarities or preference data, the statistical methods developed over the past 60 years from early factor analytic methods through Bayesian MCMC will be taught historically in order to illustrate the various perspectives of the inventors of these methods. R will be the primary software platform used in the course and all of the programs are open source and run on any platform.

Syllabus

Assignments: A series of hands-on problems every day that illustrate how each method works. R will be the primary platform but WINBUGS (or JAGS) will also be used for some problems.

Course Outline

A. Clyde Coombs’ Theory of Data: Similarities and Preferential Choice

B. Classical Scaling of Similarities Data
   1. Examples of Similarities Data – Correlation Matrices; Agreement Scores
   2. Eigenvalues and Eigenvectors
   3. Double-Centering
   4. The Solution for the Metric Similarities Problem
   5. Singular Value Decomposition

C. Non-Metric Multidimensional Scaling
   1. How Classical NMDS Works
2. Using KYST stand-alone and in R

D. Unfolding Analysis:

1. Distance (Relational) Data -- Parametric

2. Rank Order and Nominal -- Non-Parametric [Optimal Classification (OC)]

3. Nominal (Roll Call Data) -- Parametric (NOMINATE, IDEAL, MCMCPack)

E. Analysis of Issue Scales (Perceptual Data) -- Basic Space Scaling Methods