The University of Chicago
Department of Statistics

Statistics Colloquium

JUN ZHANG
Department of Psychology
University of Michigan, Ann Arbor

Borda Scores and Aggregation of Preference: A Geometric-Combinatoric and at Topological Approach

MONDAY, April 23, 2012, at 4:00PM
133 Eckhart Hall, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110.

ABSTRACT

Borda scores are defined over ranking probabilities ("voter profiles"), that is, the probability distribution over all rankings of a set of candidates. It will first be shown that the space of Borda scores form a convex polytope called "permutahedron". Investigating the various ways a permutahedron as a geometric-combinatoric object may arise allows one to appropriately define Borda scores for binary choice probabilities, for subset choice probabilities, and for rank-position probabilities. A topological approach is then adopted to study aggregation of preference under interval-scaled utilities. It turns out that any well-behaved (continuous, anonymous, and respecting unanimity) aggregation map ("social choice function") has to allow for null outcome in the social choice while not allowing for null preference by an individual voter. This result complements Chilchilnisky and Heals (1983) topological rendition of impossibility theorems of K. Arrow.