Department of Mathematics and Statistics Colloquium

Mathematics for Historys Sake:
A New Approach to Ptolemys Geography

Daniel Mintz, Pedago LLC

Abstract: Almost two thousand years ago, Claudius Ptolemy created a world map, identifying the names and coordinates of over 8,000 settlements and geographical features. Using the coordinates of those cities and landmarks that have already been identified, a series of best-fit transformations has been applied to several of Ptolemy's regional maps. The mathematical techniques involved in this process are all modern. However, these techniques must be tempered with history. To think of Ptolemys data as similar to that collected from a modern random sampling of a population and to apply unbiased statistical methods to it would be erroneous. Ptolemys data is biased, and the nature of that bias is going to be informed by the history of the data. From where did it come? When did Ptolemy receive it? How old is it? Was it the most up-to-date information? While such techniques as cluster analysis, Procrustes analysis, and multidimensional scaling are called for and can be used to transform Ptolemys data with minimal errors, the results may be inappropriate. Goodness-of-fit must be sacrificed for historical accuracy. It is only when the history of the mapped region is understood that mathematics may be applied.

Monday, October 20 at 3:45 in Roop 103

refreshments at 3:30