

Title:

The role of mathematics in Geocomputation: Two Examples

Abstract:

There are several definitions of Geocomputation. One I like is that it is "The Art and Science of Solving Complex Spatial Problems with Computers". I would extend this, however to "The Art and Science of Solving Complex Spatial Problems with Computers and Mathematics". In this talk I will outline two mathematical ideas, and how they may be applied in Geocomputation. The first is that of the *Partially Ordered Set* or *poset* - a set of items in which some pairs may be compared in some way, but others may not. This provides insight to a number of geographical problems, including the evaluation of social indicator variables, and the manipulation of certain kinds of map objects. The former of these allows the validity and meaningfulness of 'league tables' - for example relating to social wellbeing - to be scrutinised.

The second mathematical idea relates to constrained optimisation, and in part to quadratic programming, as a tool for estimating populations in small areas. This allows a geocomputational approach initially proposed in the late 1960s to be extended in a number of ways.