

Vertices and Facets of the Semiorder Polytope

A representation of a semiorder (X, P) on n elements is a function that assigns each element x_i in the semiorder a function value $f(x_i)$, and additionally, we assign a length value r . Two elements in the semiorder are incomparable if and only if their function values are within r of each other. The set of all representations of a semiorder of n elements can be viewed as a polytope in n -dimensional space. In 1990, Pirlot proved the existence of a representation of the semiorder that was minimal in the sense that all function values and the interval length were as small as possible. Such a representation corresponded to one vertex of the semiorder polytope, but this need not be the only vertex. In this talk, we look at some of the properties of these vertices as well as facets of this polytope, and of certain graphs one can associate to the semiorder.