On the unimodality of rank numbers in face lattices of certain polytopes

Laszlo Major
Tampere University of Technology, Finland

For a finite graded lattice of hight d consider the vector $(r_0, \ldots, r_d)$, where r_i is the number of elements of rank i. For a Boolean lattice this vector is a row of Pascal's triangle. For special classes of lattices combinatorial properties of this vector such as unimodality and log-concavity may be more or less difficult to ascertain. For the face lattice of a polytope the rank vector was originaly thought to be always unimodal. However this is so only for some classes of polytopes. Some recent work in this area will be discussed.

laszlo.major@tut.fi