Kira Adaricheva

Yeshiva University, USA

Optimum basis of a convex geometry

We treat a convex geometry as a closure system with the anti-exchange axiom. It is, in particular, a closure system with the unique criticals, when considered from the perspective of the implicational basis that defines it. It turns out that convex geometries have a tractable optimum basis in two of three independent parts of the basis. The third part can be effectively optimized, when the convex geometry satisfies the n-Carousel Rule, or when it does not have D-cycles. Nevertheless, the general problem of optimizing the basis of convex geometry is an NP-complete problem, which is shown by reducing the minimum vertex cover problem in a bi-partite graph to finding an optimum basis in the related geometry of convex subsets of a partially ordered set.