

Graphs and combinatorial geometry

Andrei M. Raigorodskii

Moscow Institute of Physics and Technology, Moscow, Russia

mraigor@yandex.ru

In my talk, I suppose to speak about several problems of combinatorial geometry which can be deeply treated with the help of graph theory. For example, by a graph of diameters of a (finite) set V in a metric space I mean the graph, whose vertex set coincides with V and edges are formed by all pairs of vertices at the maximum distance (diameter) in V . This graph is related to classical Borsuk's problem on partitioning sets into parts of smaller diameter, and here I will reach quite recent and somehow unexpected results in l_p -norms. Another example of geometric graphs is provided by distance graphs, which are closely connected with Nelson–Hadwiger's problem on coloring metric spaces avoiding some distances between monochromatic points. These graphs also have vertex sets lying in metric spaces, but here the edges are given by pairs of vertices at some distance apart (not necessarily the maximum one). Among others, I will speak about Johnson's graphs and their generalizations, once again reaching very recent results in the area.