VARIETY OF GENERAL POSITION PROBLEMS IN GRAPHS

Jing Tian

Zhejiang University of Science and Technology, University of Ljubljana

e-mail: ingtian526@126.com

Let X be a vertex subset of a graph G. Two vertices $u, v \in V(G)$ are X-positionable if $V(P) \cap X \subseteq \{u, v\}$ holds for any shortest u,v-path P. If every pair of vertices from X are X-positionable, then X is called a general position set. The general position number of G is the cardinality of a largest general position set of G, and this concept has been already well investigated. In this talk, I will introduce varieties of general position problems based on which natural pairs of vertices are required to be X-positionable. This yields the definition of the total (resp. dual, outer) general position number. I will demonstrate that the total general position sets coincide with sets of simplicial vertices, and that the outer general position sets coincide with sets of mutually maximally distant vertices. Additionally, I will show that a general position set is a dual general position set if and only if its complement is convex. Furthermore, I will present results on the total general position number, the outer general position number, and the dual general position number for arbitrary Cartesian products of graphs.