Resolving sets and identifying codes in finite geometries

György Kiss
Eötvös Loránd University, Budapest & University of Primorska, Koper
kissgy@cs.elte.hu

Let $\Gamma = (V, E)$ be a finite, simple, undirected graph. A vertex $v \in V$ is resolved by $S = \{v_1, \ldots, v_n\} \subset V$ if the list of distances $(d(v, v_1), d(v, v_2), \ldots, d(v, v_n))$ is unique. S is a *resolving set* for Γ if it resolves all the elements of V.

A subset $D \subset V$ is a *dominating set* if each vertex is either in D or adjacent to a vertex in D. A vertex s *separates* u and v if exactly one of u and v is in $N[s]$. A subset $S \subset V$ is a *separating set* if it separates every pair of vertices of G. Finally, a subset $C \subset V$ is an *identifying code* for V if it is both a dominating and separating set.

In this talk resolving sets and identifying codes for graphs arising from finite geometries (e.g. Levi graphs of projective and affine planes and spaces, generalized quadrangles) are considered. We present several constructions and give estimates on the sizes of these objects.