Resolving sets and identifying codes in finite geometries

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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 $\Gamma$ 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.