Publicacions més rellevants de la línia de recerca:

Geometria de les realitzacions parcials generalitzades i la seva relacio amb el *cover problem*.

Referència: F. Puerta, X. Puerta, I. Zaballa. On the parametrization of the controllability subspaces of a controllable pair. *Linear Algebra Appl.*, **401)** (2005), pp. 429-444.

Abstract: Given a controllable linear control system defined by a pair of constant matrices (A, B), the set of controllability subspaces is a stratified submanifold of the set of (A, B)-invariant subspaces. We parametrize each strata by means of coordinate charts. This parametrization has significant differences to that of (A, B)-invariant subspaces, showing a more complex geometric structure.

Referència: F. Puerta, X. Puerta, I. Zaballa, On the geometry of the solutions of the cover problem, *SIAM Journal of Control and Optimization* 45 (2) (2006), pp. 389-413.

Abstract: For a given system $\Sigma(A, B)$ and a subspace $\mathcal{S}$, the cover problem consists of finding all (A, B)-invariant subspaces containing $\mathcal{S}$. For controllable systems, the set of these subspaces can be suitably stratified. In this paper, necessary and sufficient conditions are given for the cover problem to have a solution on a given strata. Then the geometry of these solutions is studied. In particular, the set of the solutions is provided with a differentiable structure and a parameterization of all solutions is obtained through a coordinate atlas of the corresponding smooth manifold.

Referència: Marta Pe na, Ferran Puerta and Xavier Puerta. A sufcient condition for Lipschitz stability of controlled invariant subspaces *Mediterranean Journal of Mathematics*, **4 v6** (2009), pp. 475-485.

Abstract: Given a pair of matrices (A;B) we study the Lipschitz stability of its controlled invariant subspaces. A sufcient condition is derived from the geometry of the set formed by the quadruples (A;B; F; S) where S is an (A;B)-invariant subspace and F a corresponding feedback.