Publicacions més rellevants de la línia de recerca:

Estructura Geometrica de les orbites dels diferents grups de Lie que intervenen a la classificació de sistemes lineals.

Referència: A. Compta, J. Ferrer, M. Peña Use of reduced forms in the disturbance decoupling problem. *Linear algebra and its applications*, **430(5-6)** (2008), pp. 1574-1589.

Abstract: Specific algorithms, such as those involving the supremal of the invariant subspaces contained in a suitable subspace, are known to be able to test whether a Disturbance Decoupling Problem (DDP) is solvable. Here, by reducing the system to its Molinari form, we obtain an alternative description of this supremal object and compute its dimension. Hence we have a general result for solving the decoupling provided that a Molinari basis is known. In particular, a necessary numerical condition for it is derived. The same technique is applied to the DDPS, that is, when stability of the decoupled closed loop system is required.

Referència: Compta, A.; Ferrer, J.; Peña, M. Dimension of the orbit of marked subspaces. *Linear algebra and its applications*, **361()** (2004), pp. 239-248.

Abstract: Given a nilpotent endomorphism, we consider the manifold of invariant subspaces having a fixed Segre characteristic. In [Linear Algebra Appl., 332..334 (2001) 569], the implicit form of a miniversal deformation of an invariant subspace with respect to the usual equivalence relation between subspaces is obtained. Here we obtain the explicit form of this deformation when the invariant subspace is marked, and we use it to calculate the dimension of the orbit and in particular to characterize the stable marked subspaces (those with open orbit).Moreover, we study the rank of the endomorphisms in the quotient space by the subspaces in the miniversal deformation of the giving subspace.

Referència: Clotet J, Magret MD, Peña M. Differentiable structure of the set of coaxial stress-strain tensors *MATHEMATICAL METHODS IN THE APPLIED SCIENCES , 32 (14) :* , **0170-4214** (2009), pp. 1753-1767.

Abstract: In order to study stress-strain tensors, we consider their representations as pairs of

symmetric 3 x 3-matrices and the space of such pairs of matrices partitioned into equivalence classes corresponding to change of bases. We see that these equivalence classes are differentiable submanifolds; in fact, orbits under the action of a Lie group. We compute their dimension and obtain miniversal deformations. Finally, we prove that the space of coaxial stress-strain tensors is a finite union of differentiable submanifolds.