

A new look at sparsity

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Abstract: We are all used for many years to make use of sparse matrices in matrix computations and in recent years in making use of sparsity in representing functions in frames instead of bases. Also adaptivity, i.e. finding good meshes in the solution of ODEs or PDEs has the goal to find a sparse representation of the solution in an appropriate function space.

But in all these case the goals are different, they are heavily dependent on the space of functions that one is considering and the computational methods that one has in mind. We present a more general point of view which takes all these points into account and discusses sparsity in general framework including problem complexity, computational complexity, storage complexity.