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The Douglas-Rachford algorithm: inconsistency and finite convergence

The Douglas-Rachford algorithm is a classical optimization method for finding minimizers of the sum of two convex (possibly nonsmooth) functions. When specialized to indicator functions of closed convex sets, it will find a point in the intersection of the two sets comprising the associated convex feasibility problem.

In this talk, I will report on two recent developments concerning the Douglas-Rachford algorithm: (1) If the sets are affine but possibly nonintersecting subspaces, then DRA actually converges to the point nearest to the starting point in the "generalized" intersection. (2) In the affine-polyhedral case, finite convergence occurs under a Slater-type constraint qualification.