A primal-dual Douglas-Rachford type algorithm for nonsmooth convex optimization problems with complex structures

Radu Ioan Boţ
Faculty of Mathematics
University of Vienna
E-mail: radu.bot@univie.ac.at

We address the solving of nonsmooth convex optimization problems with complex structures, by solving the corresponding system of optimality conditions that involves sums of linear compositions of parallel sums of maximally monotone operators. We formulate an iterative scheme of Douglas-Rachford type, which processes the set-valued maximally monotone operators via backward steps and the linear continuous operators via explicit forward steps, and analyze its convergence behaviour. The performances of the proposed algorithm are illustrated by numerical experiments in optimal location selection, convex risk minimization and video processing.