PROXIMAL SPLITTING METHODS FOR SOLVING NONSMOOTH CONVEX OPTIMIZATION PROBLEMS

ERNÖ ROBERT CSETNEK[1]

In the first part of the talk we recall the main proximal splitting methods for solving nonsmooth convex optimization problems (proximal, proximal-gradient, ADMM, proximal ADMM, primal-dual algorithms).

In the main part of the talk we present our recent contributions to this topic. We propose a unifying scheme for several algorithms from the literature dedicated to the solving of monotone inclusion problems involving compositions with linear continuous operators in infinite dimensional Hilbert spaces. We show that a number of primal-dual algorithms for monotone inclusions and also the classical ADMM numerical scheme for convex optimization problems, along with some of its variants, can be embedded in this unifying scheme. The last part is devoted to the derivation of convergence rates obtained by combining variable metric techniques with strategies based on suitable choice of dynamical step sizes.

[1] University of Vienna, Faculty of Mathematics
E-mail address: ernoe.robert.csetnek@univie.ac.at