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Adaptive Splitting Algorithms

A general optimization problem can often be reduced to finding a zero of a sum of multiple (maximally) monotone operators, which creates challenging computational tasks as a whole. It motivates the development of splitting algorithms in order to simplify the computations by dealing with each operator separately. Some of the most successful splitting algorithms in applications are the forward-backward algorithm, the Douglas-Rachford algorithm, and the alternating directions method of multipliers (ADMM). In this talk, we discuss some adaptive generalizations of such splitting algorithms. The main idea is to adapt the algorithm parameters to the properties of each operators so that the generated sequences converge to a fixed point.