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Extrapolated proximal subgradient algorithms for nonconvex and nonsmooth fractional programs. Preliminary report.

In this work, we consider a broad class of nonsmooth and nonconvex fractional programs including composite optimization problems and encompassing many important modern fractional optimization problems arising from signal processing, discriminant analysis, and finance. We propose extrapolated proximal subgradient algorithms for solving this optimization model and analyze their convergence properties. The choice of our extrapolation parameter is flexible and includes the popular extrapolation parameter adopted in the restarted Fast Iterative Shrinking-Threshold Algorithm (FISTA). By providing a unified analysis framework of descent methods, we establish the convergence of the full sequence under the assumption that a suitable merit function satisfies the Kurdyka–Lojasiewicz property. Our theoretical results are illustrated with both analytical and simulated numerical examples. This is based on joint work with R.I. Bot (Uni. Vienna) and G. Li (UNSW Sydney). (Received September 15, 2020)