Proximal-gradient algorithms for fractional programming

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In this talk we present two proximal gradient algorithms for fractional programming problems in real Hilbert spaces, where the numerator is a proper, convex and lower semicontinuous function and the denominator is a smooth function, either concave or convex. The iterative schemes perform a proximal step with respect to the nonsmooth numerator and a gradient step with respect to the smooth denominator. For the case of a concave denominator, the algorithm has the particularity that it generates sequences which approach both the (global) optimal solutions set and the optimal objective value of the underlying fractional programming problem. For the case of a convex denominator, the numerical scheme approaches the set of critical points of the objective function, provided the latter satisfies the Kurdyka-Łojasiewicz property. The talks relies on a joint work with E.R. Csetnek.