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Numerical Variational Analysis

Numerical Analysis, the study of approximating analytic properties of a function, has established a collection of formulas for approximating derivatives, gradients, and Hessians. Naturally, these formulas are designed under restrictive smoothness assumptions on the function. Variational Analysis includes a great deal of research on understanding analytic properties of nonsmooth functions, for example the classic subdifferential of a convex function. In this talk we advance the idea of Numerical Variational Analysis, the study of approximating analytic properties of a nonsmooth function. We discuss some recent results and note that open research directions abound.