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Generalized differentiability, duality and optimization for problems dealing with differences of convex functions. (English) [Zbl 0591.90073](#)

Convexity and duality in optimization, Proc. Symp., Groningen/Neth. 1984, Lect. Notes Econ. Math. Syst. 256, 37-70 (1985).

[For the entire collection see [Zbl 0569.00010](#).]

A large number of optimization problems of practical interest actually involve d.c. functions, i.e. functions that can be expressed as a difference of two convex functions. From a theoretical point of view, the importance of such functions stems from their relationship to convex functions and the fact that they constitute a linear space which is a dense subset of the space of continuous functions over a compact set. The reviewed article gives an excellent survey of the main known results on the analysis and optimization of d.c. functions. The following questions are discussed: differential properties, characterization of d.c. functions among locally Lipschitz functions, finding the "best" d.c. representation of a given function, duality results, in particular the basic Toland's duality relation. Also a preview on procedures for globally minimizing a d.c. function is presented.

Reviewer: [Hoang Tuy](#)

MSC:

- [90C30](#) Nonlinear programming
- [49M37](#) Numerical methods based on nonlinear programming
- [26B05](#) Continuity and differentiation questions
- [26B25](#) Convexity of real functions of several variables, generalizations
- [90-02](#) Research exposition (monographs, survey articles) pertaining to operations research and mathematical programming
- [49N15](#) Duality theory (optimization)

Cited in **2** Reviews
Cited in **58** Documents

Keywords:

generalized differentiability; d.c. functions; difference of two convex functions; survey; differential properties; locally Lipschitz functions; duality results