ON LOWER BOUNDS OF THE SECOND-ORDER

DINI DIRECTIONAL DERIVATIVES

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In this paper we show that the upper Dini directional derivative of an radially upper semicontinuous function has the same lower bounds as the lower Dini directional derivative, and that the second-order upper Dini directional derivative of an radially upper semicontinuous function, which satisfies some additional assumptions, has the same lower bounds as the second-order lower Dini directional derivative. A second-order complete characterization of a convex function is obtained in terms of the second-order upper Dini derivative and of the first-order one. These results are extensions of the respective theorems of L. R. Huang and K. F. Ng.
A second-order Taylor inequality is derived.

Keywords: nonsmooth analysis, lower bounds of Dini directional derivatives, lower bounds of second-order Dini directional derivatives

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