First-Order Optimality Conditions for a Lower Order Penalty Function via Second-Order Information

X.Q. Yang and Z.Q. Meng

Abstract: In this paper, we obtain first-order necessary and sufficient conditions for a local minimum of a lower order penalty function of an inequality constrained optimization problem by estimating Dini-directional derivatives in terms of a second-order Taylor expansion. Finally, we show that the limiting point of the sequence of Dini-stationary points of the lower order penalty function satisfies the Kuhn-Tucker optimality condition under a constraint qualification of non-existence of positive second-order directional derivative.