Abstract

Directional derivatives of value functions play an essential role in the sensitivity and stability analysis of parametric optimization problems, in studying bi-level and min–max problems, in quasi-differentiable calculus. Their calculation is studied in numerous works by A.V. Fiacco, V.F. Demyanov and A.M. Rubinov, R.T. Rockafellar, A. Shapiro, J.F. Bonnans, A.D. Ioffe, A. Auslender and R. Cominetti, and many other authors. This article is devoted to the existence of the second order directional derivatives of value functions in parametric problems with non-single-valued solutions. The main idea of the investigation approach is based on the development of the method of the first-order approximations by V.F. Demyanov and A.M. Rubinov.