

Vector variational-like inequalities and vector optimization problems

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ABSTRACT.

In this paper, we present the concept of generalized invexity for vector-valued functions. Also, we consider different kinds of generalized vector variational-like inequality and a vector optimization problem. Some relations between vector variational-like inequalities and a vector optimization problem are established by using the properties of Mordukhovich limiting subdifferential.

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REFERENCES

- [1] Al-Homidan, S. and Ansari, Q. H., *Generalized Minty vector variational-like inequalities and vector optimization problems*, J. Optim. Theory Appl., **144** (2010), 1–11
- [2] Ansari, Q. H. and Lee, G. M., *Nonsmooth vector optimization problems and Minty vector variational inequalities*, J. Optim. Theory Appl., **145** (2010), No. 1, 1–16
- [3] Ansari, Q. H., Rezaie, M. and Zafarani, J., *Generalized variational-like inequalities and vector optimization*, J. Global Optim., 2011, doi 10.1007/s10898-011-9686-1
- [4] Chen, B. and Huang, N. J., *Vector variational-like inequalities and vector optimization problems in Asplund spaces*, Optim. Lett., 2011, doi 10.1007/s11590-011-0346-7
- [5] Garzon, G. R., Gomez, R. O. and Lizana, A. R., *Relationship between vector variational-like inequality and optimization problems*, Eur. J. Oper. Res., **157** (2004), 113–119
- [6] Giannessi, F., On Minty variational principle, In: Giannessi, F., Komlósi, S., Tapcsáck, T. (eds.) *New Trends in Mathematical Programming*, pp. 93-99, Kluwer Academic, Dordrecht, 1998
- [7] Giannessi, F., *Vector Variational Inequalities and Vector Equilibria: Mathematical Theories*, Kluwer Academic, Dordrecht, 2000
- [8] Giannessi, F., Maugeri, A. and Pardalos, P. M., *Equilibrium Problems: Nonsmooth Optimization and Variational Inequalities Models*, Springer, Berlin, 2002
- [9] Jabarootian, T. and Zafarani, J., *Generalized invariant monotonicity and invexity of non-differentiable functions*, J. Global Optim., **36** (2006), 537–564
- [10] Mordukhovich, B., *Variations analysis and generalized differentiation, I: basic theory*, Grundlehren series (fundamental principles of mathematical sciences), **330** (2006), Springer, Berlin
- [11] Oveisihha, M. and Zafarani, J., *Vector optimization problem and generalized convexity*, J. Global Optim., 2011, doi 10.1007/s10898-011-9657-6
- [12] Pardalos, P. M., Rassias, T. M. and Khan, A. A., *Nonlinear Analysis and Variational Problems*, Springer, Berlin, 2010
- [13] Rezaie, M. and Zafarani, J., *Vector optimization and variational-like inequalities*, J. Global Optim., **43** (2009), 47–66
- [14] Soleimani-damaneh, M., *Characterizations and applications of generalized invexity and monotonicity in Asplund spaces*, Topology, 2010, doi10.1007/s11750-010-0150-z

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- [15] Yang, X. M. and Yang, X. Q., *Vector variational-like inequalities with pseudoinvexity*, *Optimization*, **55** (2006), 157-170
- [16] Yang, X. M., Yang, X. Q. and Teo, K. L., *Some remarks on the Minty vector variational inequality*, *J. Optim. Theory Appl.*, **121** (2004), 193-201

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