matematicko-fyzikální fakulta

Referee report on the PhD-thesis

Mgr. Lukáš Adam
Hierarchical problems with evolutionary equilibrium constraints

As announced in the title, the submitted work deals with nonsmooth variational analysis, particularly, hierarchical problems with evolutionary equilibrium constraints are studied. The author is giving a description of the used symbolic and terminology in Preliminaries. Chapter 3 with computation of limiting normal cone to union of polyhedral sets seems to be the key part of the thesis. This result is the main tool for proceeding results and applications.

Content in short, Chapter 4 considers parametrized differential inclusions and its sensitivity, Chapter 5 treats optimal control problem of a dynamical system, and, Chapter 6 deals with parameter identification in delamination model. This problem is infinite dimensional both in time and space.

Problems are considered in continuous time setting and their discretization is formulated and investigated.

Using results from Chapter 3, the author determined a normal cone to graph of a multifunction of S^K (Solution map for discrete setting.) Generalizations of Lipschitz property for multifunctions are mentioned and used, as Aubin property or calmness.

Treated problems are hard to handle since typically Mangasarian-Fromovitz constraint qualifications is not fulfilled. The author had to employed more finer means.

The thesis contains original results of the author which are partially published in [3], [4], [5], [6].

The submitted text reached the significant level of scientific work. The subject of thesis is relevant and correctly evolved. It originates in practice and is applicable. The author shows his knowledge of the "state-of-art" of the discussed subject. The thesis uses appropriate means for nonsmooth variational calculus.

Finally, I conclude that the submitted work fulfills all requirements for PhD-thesis. Therefore, I recommend to award the degree of PhD to Mgr. Lukáš Adam.

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