VIETNAM ACADEMY
OF SCIENCE AND TECHNOLOGY
Institute of Mathematics

SOCIALIST REPUBLIC OF VIETNAM
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SUMMARY OF PHD DISSERTATION

Dissertation Title: *Subdifferentials of Optimal Value Functions in Parametric Convex Optimization Problems*
Speciality: Applied Mathematics
Speciality code: 9 46 01 12
PhD student: Duong Thi Viet An
Supervisor: Prof. Dr.Sc. Nguyen Dong Yen
Training Institute: Institute of Mathematics, Vietnam Academy of Science and Technology

This dissertation studies differential stability of convex optimization problems under inclusion constraints and differential stability of two classes of optimal control problems. The first part of the dissertation presents formulas for computing or estimating the subdifferential and the singular subdifferential of the optimal value function in parametric convex programming problems under inclusion constraints. Moreover, the connections between the subdifferentials of the optimal value function of parametric optimization problems and certain multiplier sets are shown. The second part applies some results of the first part to parametric optimal control problems with convex objective functions and linear dynamical systems, either discrete or continuous. Among the obtained results, there are formulas for computing the subdifferential and the singular subdifferential of the optimal value function via the data of the given optimal control problem.

The main results of the dissertation include:
1. Formulas for computing or estimating the subdifferential and the singular subdifferential of the optimal value function of parametric convex mathematical programming problems under inclusion constraints;
2. Formulas showing the connection between the subdifferentials of the optimal value function of parametric convex mathematical programming problems under geometrical and/or functional constraints and certain multiplier sets;
3. Formulas for computing the subdifferential and the singular subdifferential of the optimal value function of convex optimal control problems under linear constraints via the problem data.

February 27, 2018

Supervisor   PhD student

Prof. Dr.Sc. Nguyen Dong Yen   **Duong Thi Viet An**