Second-order Optimality Conditions for a Semilinear Elliptic Optimal Control Problem with Mixed Pointwise Constraints

B. T. Kien[1], **V. H. Nhu**[2], **and N. H. Son**[3]

Abstract: In this report, we present some recent results on second-order optimality conditions for a semilinear elliptic optimal control problem with mixed pointwise constraints. We show that in some cases, there is a common critical cone under which the second-order necessary and sufficient optimality conditions for the problem are valid. Our results approach to a theory of no-gap second-order optimality conditions. In order to obtain such results, we reduce the problem to a special mathematical programming problem with polyhedricity constraint set. We then use some tools of variational analysis and techniques of semilinear elliptic equations to analyze second-order conditions.

[1] Department of Optimization and Control Theory
    Institute of Mathematics
    Vietnam Academy of Science and Technology
    18 Hoang Quoc Viet road, Hanoi, Vietnam
    btkien@math.ac.vn

[2] Department of Scientific Fundamentals
    Posts and Telecommunications Institute of Technology
    Hanoi, Vietnam
    vuhuunhu1983@gmail.com

[3] School of Applied Mathematics and Informatics
    Hanoi University of Science and Technology
    1 Dai Co Viet, Hanoi, Vietnam
    son.nguyenhai1@hust.edu.vn